

88636

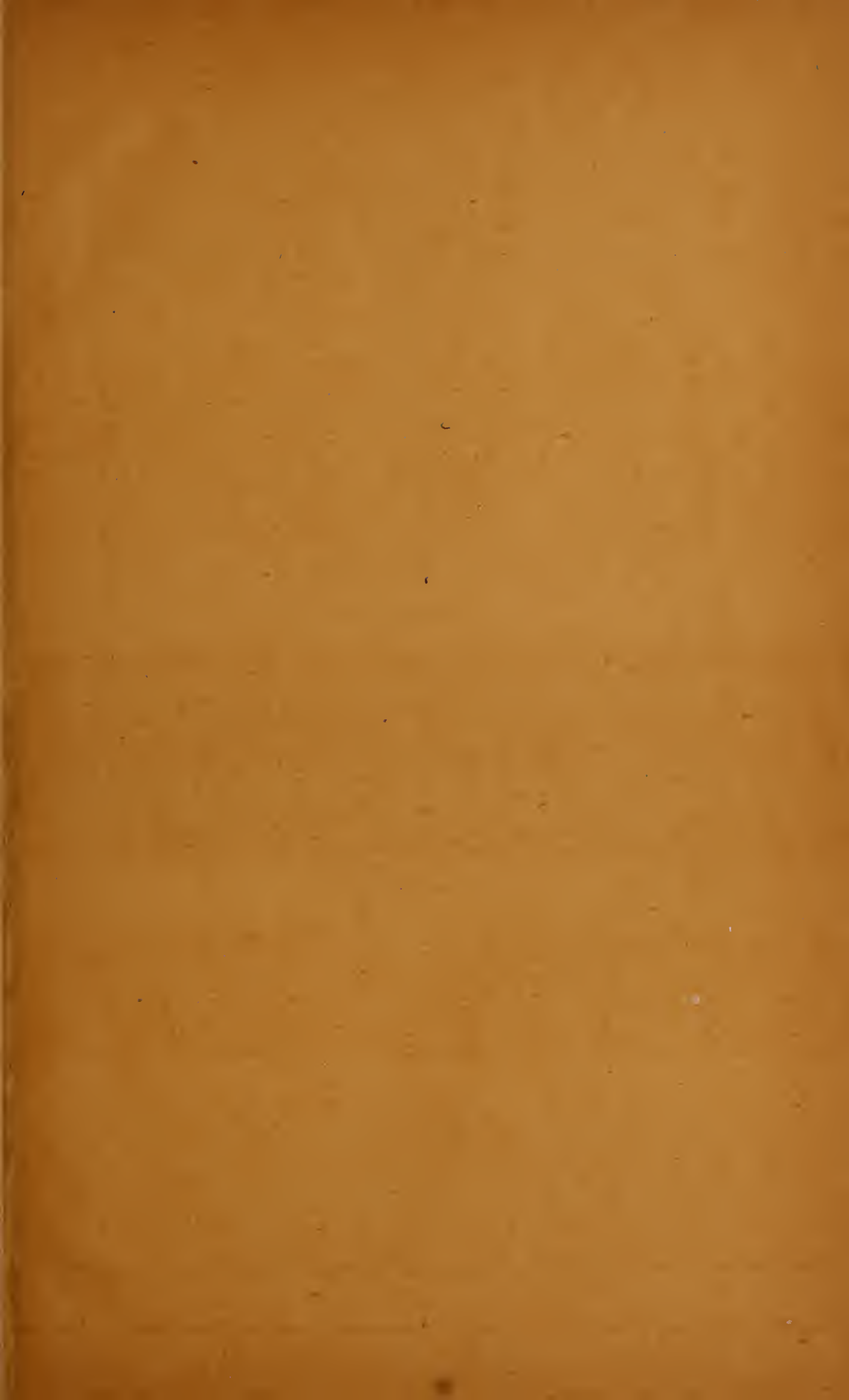


Class _____ No. _____

IN EXCHANGE.

2^o





THE JOURNAL OF
OPHTHALMOLOGY
OTOLOGY AND LARYNGOLOGY.

VOLUME V, 1893.

CHARLES DEADY, M. D., EDITOR.

ASSOCIATE EDITORS:

H. H. CRIPPEN, M. D., OPHTHALMOLOGY AND OTOLOGY.

HORACE F. IVINS, M. D., LARYNGOLOGY.

A. L. CHATTERTON & CO.,

78 MAIDEN LANE, NEW YORK.

MARTIN & PLEASANCE, Melbourne.

LAHIRI & CO., Calcutta.

Budget 1/2

WELCOME TO THE
TO
APPLAUSE

LIST OF CONTRIBUTORS TO VOL. V.

- | | |
|-----------------------------------|-----------------------------------|
| ARMAIGNAC, H., | HOUGHTON, HENRY C., New York |
| BOYLE, CHAS. C., New York City. | City. |
| BATES, F. D. W., Hamilton, Ont. | HUNT, W. BIRDSALL, St. Paul, |
| BISSELL, E. J., Rochester, N. Y. | Minn. |
| BRICKLEY, E. W., York, Pa. | JONES, CHAS. E., A. M., M. D., |
| BELLOWS, HOWARD P., Boston, | Albany, N. Y. |
| Mass. | KEELER, E. ELMER, Syracuse, N. Y. |
| BIGLER, WM. H., Philadelphia, Pa. | KELLOGG, F. B., Tacoma, Wash. |
| CAMPELL, JAS. A., St. Louis, Mo. | KING, WM. R., Washington, D. C. |
| CASSEDAY, F. F., Minneapolis, | LEWIS, F. PARK, Buffalo, N. Y. |
| Minn. | LINNELL, E. H., Norwich, Conn. |
| CRIPPEN, H. H., Salt Lake City, | PAYNE, JNO. H., Boston, Mass. |
| Utah. | QUAY, GEO. H., Cleveland, O. |
| CATHELL, D. W., Baltimore, Md. | REYNOLDS, W. U., New York City. |
| DARIER, A., Paris, France. | RAUGÉ, PAUL, Chelles, France. |
| DUNN, W. A., Chicago, Ill. | SHEARER, THOMAS C., Baltimore, |
| FELLOWS, C. GURNEE, Chicago, Ill. | Md. |
| FISHER, H. F., Nashville, Tenn. | TEETS, CHAS. E., New York City. |
| FRENCH, HAYES C., San Francisco, | THOMAS, WM. DULANY, Baltimore, |
| Cal. | Md. |
| GAREY, HENRY F., Baltimore, Md. | TOWNSEND, IRVING, New York City. |
| GARRISON, J. B., New York City. | WARNER, ALTON G., Brooklyn, N. Y. |
| HELFRICH, CHAS. H., New York | WILSON, HAROLD, Detroit, Mich. |
| City. | WOODVINE, D. G., Boston, Mass. |

JUN 27 1914

88636



Digitized by the Internet Archive
in 2014

<https://archive.org/details/journalofophthal5189amer>

GENERAL INDEX TO VOL. V.

| | |
|---|-----|
| Advancements, Recent, in Otology. H. P. Bellows..... | 209 |
| Air Gun, Dislocation of the Lens and Subsequent Cataract by Shot from. A. G. Warner..... | 88 |
| Anisometropia. W. H. Bigler | 30 |
| Apropos of the Rarity of Cortical Laryngeal Paralyses. Paul Raugé..... | 48 |
| Aural Diseases, Efficacy of Vibrometer in. H. F. Garey..... | 269 |
| ARMAIGNAC, DR. H. Report on the Ophthalmoplegias..... | 363 |
| Atresia Nasi Externi. E. Elmer Keeler..... | 334 |
| BATES, F. D. W. The Treatment of Insufficiency of the Internal Recti muscles by Systematic Exercise with Prisms..... | 45 |
| BELLOWS, HOWARD P. Some Recent Advancements in Otology.. | 209 |
| BIGLER, W. H. Anisometropia..... | 30 |
| BISSELL, E. J. Sound as a Therapeutic Agent in Deafness..... | 126 |
| — Discussion of Paper of. H. C. Houghton... .. | 131 |
| Blindness, Word, and its Concomitants, Notes on. H. H. Crippen and F. F. Casseday..... | 178 |
| Body, Foreign, in Conjunctiva. W. B. Hunt | 86 |
| BOYLE, CHAS. C. A Case of Nuclear Iridoplegia..... | 83 |
| BRICKLEY, E. W. A Case of Ocular Traumatism..... | 135 |
| CAMPBELL, JAS. A. Ocular Reflex Neuroses..... | 197 |
| An Improved Nasal Nozzle for Politzer's Inflation..... | 147 |
| — A Fenestrated Chalazion Spatula as an Aid in Lid Tumor Opera- tions..... | 148 |
| Carcinoma, Encephaloid, of Pharynx and Œsophagus. C. E. Jones..... | 120 |
| CASSEDAY, F. F. Notes on Word-Blindness and its Concomitants. .89, | 178 |
| — Therapeutics of Nose and Throat..... | 138 |
| Cataract Subsequent to a Shot from an Air Gun. A. G. Warner.. | 88 |
| Catarrh, Naso-Pharyngeal, Dyspepsia as an Underlying Cause of. W. D. Thomas. | 37 |
| Chalazion Spatula, Fenestrated. J. A. Campbell..... | 148 |
| Chamber, Anterior Hemorrhage into from Coughing. A. G. Warner.... | 150 |
| Changeable Test Type, New. Chas. H. Helfrich..... | 340 |
| Choroid and Retina, Subconjunctival Injections of Sublimate in Diseases of. A. Darier..... | 63 |
| Chronic Rhinitis, Treatment of, by the Homeopath. Chas. E. Teets.. | 218 |
| Cocaine, Notes on Improved Solution of. I. Townsend.. | 152 |
| Constriction of Œsophagus. D. G. Woodvine..... | 278 |
| Conjunctiva, A Foreign Body in. W. B. Hunt..... | 86 |
| Correction and Study of Heterophoria. Harold Wilson..... | 227 |
| Cortical Laryngeal Paralyses. Paul Raugé..... | 48 |
| CRIPPEN, H. H. Notes on Word-Blindness and its Concomitants. .89, | 178 |
| Criticism, A—Senega in Treatment of Hyperphoria. H. Wilson..... | 155 |
| DARIER, A. Subconjunctival Injections of Sublimate in Diseases of the Choroid and of the Retina..... | 63 |
| Deafness, Use of Vibrometer in. W. R. King..... | 274 |
| Deafness, Sound as a Therapeutic Agent for. E. J. Bissell..... | 126 |
| Diphtheria. J. B. Garrison..... | 80 |
| Disease of Sound-conducting Apparatus, Sound as a Factor in Treatment of. H. C. Houghton..... | 26 |
| Discussion of Dr. Garey's Paper. W. R. King..... | 274 |
| Discussion of Dr. Bissell's Paper. H. C. Houghton..... | 131 |
| Dislocation of Lens and Subsequent Cataract by Shot from an Air Gun. A. G. Warner..... | 88 |

| | |
|---|-----|
| Dyspepsia as an Underlying Cause of Naso-pharyngeal Catarrh. W. D. Thomas..... | 37 |
| Disease of Choroid and Retina, Subconjunctival Injections of Sublimate in. A. Darier..... | 63 |
| DUNN, W. A. Nasal Epithelioma..... | 328 |
| Efficacy of the Vibrometer in Applying Vibratory Massage in Aural Diseases. H. F. Garey..... | 269 |
| Electricity's Field in Ophthalmic Therapeutics. William R. King..... | 346 |
| Electro-Cautery in Diseases of the Nose and Throat. Thomas L. Shearer | |
| Encephaloid Carcinoma of Pharynx and Œsophagus. C. E. Jones..... | 120 |
| Esophagus, Constriction of. D. G. Woodvine..... | 278 |
| Faradism in the Treatment of Rhinitis Catarrhalis Atrophicans Chronica. J. B. Garrison..... | 343 |
| Fauces and Pharynx, Pseudo-syphilitic Lesions of. W. R. King..... | 20 |
| Fellows, C. Gurnee. Remote Causes of Pharyngeal Catarrh..... | 351 |
| FISHER, H. F. Malignant Growths in Larynx..... | 255 |
| Foreign Body in Conjunctiva. W. B. Hunt..... | 86 |
| FRENCH, HAYES C. Unsettled Questions in Ophthalmology..... | 264 |
| GAREY, HENRY F. The Efficacy of the Vibrometer in Applying Vibratory Massage in Aural Diseases | 269 |
| GARRISON, J. B. Diphtheria..... | 80 |
| — Faradism in the Treatment of Rhinitis Catarrhalis Atrophicans Chronica..... | 343 |
| Grippe a Cause of Middle Ear Disease. H. C. Houghton..... | 243 |
| Growths, Malignant, in Larynx. H. F. Fisher..... | 255 |
| HELFRICH, CHAS. H. A New Changeable Test Type..... | 340 |
| Hemorrhage into Anterior Chamber of the Eye from Coughing. A. G. Warner..... | 150 |
| Heterophoria, An Observation made in Cases of. J. H. Payne..... | 170 |
| Heterophoria, Study and Correction of. Harold Wilson..... | 227 |
| Homatropin Hydrochlorate, The Uncertainty of and Insufficiency of as a Refractive Cyclopegic. F. P. Lewis..... | 145 |
| HOUGHTON, HENRY C. Sound as a Factor in the Treatment of Disease of the Sound-conducting Apparatus..... | 26 |
| — Discussion of Dr. Bissell's Paper..... | 131 |
| — La Grippe a Cause of Middle Ear Disease..... | 243 |
| Hyperphoria, Senega in Treatment of. E. H. Linnell..... | 9 |
| Hyperphoria, Senega in Treatment of. A Criticism. H. Wilson..... | 155 |
| Hypertrophic Rhinitis. Irving Townsend..... | 357 |
| HUNT, W. BIRDSALL. A Foreign Body in the Conjunctiva | 86 |
| Improved Nasal Nozzle for Politzer's Inflation. J. A. Campbell. | 147 |
| Improved Solution of Cocaine. I. Townsend..... | 152 |
| Injections, Subconjunctival, of Sublimate in Diseases of Choroid and Retina. A. Darier..... | 63 |
| Insufficiency of Internal Recti Muscles, Treatment of, by Systematic Exercise with Prisms. F. D. W. Bates..... | 45 |
| Insufficiency and Uncertainty of Homatropine Hydrochlorate as a Refractive Cyclopegic. F. P. Lewis..... | 145 |
| Internal Recti Muscles, Treatment of Insufficiency of, by Systematic Exercise with Prisms. F. D. W. Bates | 45 |
| Iridoplegia, Nuclear, a Case of. C. C. Boyle..... | 83 |
| Items..... | 196 |
| JONES, CHAS. E. A Case of Encephaloid Carcinoma of Pharynx and Œsophagus | 120 |
| KING, WM. R. Discussion of Dr. Garey's Paper, Use of Vibrometer.. | 274 |
| — Electricity's Field in Ophthalmic Therapeutics..... | 346 |
| — Pseudo-syphilitic Lesions of the Fauces and Pharynx..... | 20 |
| KEELER, ELMER E. Atresia Nasi Externi | 334 |
| KELLOGG, F. B. Vienna Men and Opportunities..... | 171 |
| La Grippe, A Cause of Middle Ear Disease. H. C. Houghton | 243 |

| | |
|---|-----|
| Larynx, Malignant Growths in. H. F. Fisher | 255 |
| Laryngeal Paralyzes, Cortical. Paul Raugé | 48 |
| Lens, Dislocation of, by Shot from an Air Gun. A. G. Warner | 88 |
| Lesions, Pseudo-syphilitic, of the Fauces and Pharynx. W. R. King ... | 20 |
| LEWIS, F. PARK. The Uncertainty and Insufficiency of Homatropine Hydrochlorate as a Refractive Cyclopegic | 145 |
| Light and Refraction, A study in. W. U. Reynolds | 289 |
| LINNELL, E. H., Senega in Treatment of Hyperphoria and its Resultant Symptoms | 9 |
| Malignant Growths in Larynx. H. F. Fisher | 255 |
| Measure of Refraction, A Unit of. W. U. Reynolds | 103 |
| Middle Ear Disease, La Grippe a Cause of. H. C. Houghton | 243 |
| Muscles, Internal Recti, Treatment of Insufficiency of, by Systematic Exercise with Prisms. F. D. W. Bates... .. | 45 |
| Mycosis Lingualis. Geo. H. Quay..... | 338 |
| Nasal Catarrh. A Few Tried Remedies in the Treatment of. Wm. Dulany Thomas | 354 |
| Nasal Epithelioma. W. A. Dunn..... | 328 |
| Nasal-Pharyngeal Catarrh, Dyspepsia as the Underlying Cause of. W. D. Thomas | 37 |
| New Suggestions in Treatment of Constriction of Œsophagus. D. G. Woodvine..... | 278 |
| Neuroses, Ocular Reflex. Jas. A. Campbell | 196 |
| Nose and Throat, Therapeutics of. F. F. Casseday..... | 138 |
| Nozzle, Improved Nasal, for Politzer's Inflation. J. A. Campbell .. | 147 |
| Nuclear Iridoplegia, A Case of. C. C. Boyle..... | 83 |
| Observations Made in Cases of Heterophoria. J. H. Payne..... | 170 |
| Ocular Traumatism, A Case of. E. W. Brickley..... | 135 |
| Ocular Reflex Neuroses. Jas. A. Campbell..... | 197 |
| Œsophagus and Pharynx, Encephaloid Carcinoma of. Chas. E. Jones.. | 120 |
| Ophthalmology, Unsettled Questions in. H. C. French..... | 264 |
| Ophthalmoplegias, Report on the. Dr. H. Armaignac... .. | 363 |
| Otology, Some Recent Advancements in. H. P. Bellows... .. | 209 |
| Paralyzes, Cortical Laryngeal. P. Raugé..... | 48 |
| PAYNE, JNO. H. An Observation Made in Cases of Heterophoria.... | 170 |
| Pharyngeal Catarrh, Remote Causes of. C. Gurnee Fellows..... | 351 |
| Pharynx and Œsophagus, Encephaloid Carcinoma of. C. E. Jones..... | 120 |
| Pharynx and Fauces, Pseudo-syphilitic Lesions of. W. R. King..... | 20 |
| Poltitzer's Inflation, An Improved Nasal Nozzle for. J. A. Campbell.... | 147 |
| Prisms, Treatment of Insufficiency of Internal Recti Muscles by System- atic Exercise with. F. D. W. Bates..... | 45 |
| Pseudo-syphilitic Lesions of the Fauces and Pharynx. W. R. King.... | 20 |
| QUAY, GEORGE H. Mycosis Lingualis..... | 338 |
| Questions, Unsettled, in Ophthalmology. H. C. French..... | 264 |
| RAUGÉ, PAUL. Apropos of the Rarity of Cortical Laryngeal Paralyzes | 48 |
| Recent Advancements in Otology. Howard P. Bellows..... | 209 |
| Reflex Ocular Neuroses. Jas. A. Campbell..... | 197 |
| Refraction, A Unit of Measure of. W. U. Reynolds..... | 103 |
| Retina and Choroid, Subconjunctival Injections of Sublimate in Diseases of. A. Darier..... | 63 |
| Reviews: Allen, Samuel Ellsworth. The Mastoid Operation, including its History, Anatomy, and Pathology..... | 195 |
| Berry, Geo. A. Diseases of the Eye..... | 372 |
| Burnett, Chas. H. System of Diseases of Ear, Nose, and Throat... | 370 |
| Cathell, D. W. Book on the Physician himself, and Things that Concern his Reputation and Self..... | 101 |
| Chapman, Henry S. A Manual on Medical Jurisprudence and Tox- icology..... | 101 |
| Field, Geo. P. A Manual of Diseases of the Ear... .. | 372 |
| Fuchs, Ernest. Text-book of Ophthalmology..... | 189 |

Reviews—*Cont'd.*

| | |
|---|---------|
| Ingalls, E. Fletcher. Diseases of the Chest, Throat, and Nasal Cavities | 193 |
| Ivins, H. F. Diseases of the Nose and Throat..... | 286 |
| Norton, A. B. Ophthalmic Diseases and Therapeutics..... | 192 |
| McMichael, Arkell Roger. A Compendium of Materia Medica, Therapeutics, and Repertory of Digestive System..... | 190 |
| Seiler, Carl. Handbook of the Diagnosis and Treatment of Diseases of the Throat, Nose, and Naso-Pharynx..... | 373 |
| REYNOLDS, W. U. A Study in Light and Refraction..... | 289 |
| — A Unit of Measure of Refraction..... | 103 |
| Rhinitis, Treatment of Chronic, by the Homeopath. C. E. Teets..... | 218 |
| Senega in Treatment of Hyperphoria and its Resultant Symptoms. E. H. Linnell..... | 9 |
| Senega in Treatment of Hyperphoria,—A Criticism. H. Wilson..... | 155 |
| SHEARER, THOMAS L. Electro-Cautery in Diseases of the Nose and Throat.... | 317 |
| Sound as a Therapeutic Agent in Deafness. E. J. Bissell..... | 126 |
| Sound-conducting Apparatus, Sound as a Factor in Treatment of Disease of. H. C. Houghton..... | 26 |
| Sound as a Factor in Treatment of Disease of the Sound-conducting Apparatus. H. C. Houghton..... | 26 |
| Spatula, a Fenestrated Chalazion. J. A. Campbell.... | 148 |
| Study and Correction of Heterophoria. H. Wilson.... | 227 |
| Sublimate, Subconjunctival Injections of, in Diseases of Choroid and Retina. A. Darier..... | 63 |
| Suggestions on Treatment of Constrictions of Œsophagus. D. G. Woodvine..... | 278 |
| Syphilitic Lesions (Pseudo) of the Fauces and Pharynx. W. R. King. | 20 |
| TEETS, CHAS. E. The Treatment of Chronic Rhinitis by the Homeopath..... | 218 |
| Therapeutics of the Nose and Throat. F. F. Casseday..... | 138 |
| THOMAS, WM. DULANY. Dyspepsia as an Underlying Cause of Naso-pharyngeal Catarrh.... | 37 |
| — A few Tried Remedies in the Treatment of Nasal Catarrh..... | 354 |
| Throat and Nose, Therapeutics of. F. F. Casseday..... | 138 |
| TOWNSEND, IRVING. Hypertrophic Rhinitis..... | 357 |
| — Notes on an Improved Solution of Cocaine..... | 152 |
| Traumatism, Ocular, A Case of. E. W. Brickley..... | 135 |
| Treatment of Chronic Rhinitis by the Homeopath. Chas. E. Teets.... | 218 |
| Treatment of Insufficiency of Internal Recti Muscles by Systematic Exercise with Prisms. F. D. W. Bates..... | 45 |
| Uncertainty and Insufficiency of Homatropine Hydrochlorate as a Refractive Cyclopegic. F. P. Lewis | 145 |
| Unit of Measure of Refraction. W. U. Reynolds..... | 103 |
| Unsettled Questions in Ophthalmology. H. C. French..... | 264 |
| Vibrometer in Aural Diseases. H. F. Garey..... | 269 |
| Vibrometer, Use of, in Treatment of Deafness. W. R. King..... | 274 |
| Vienna Men and Opportunities. F. B. Kellogg..... | 171 |
| WARNER, ALTON G. Hemorrhage into Anterior Chamber of Eye by Coughing | 150 |
| — Dislocation of the Lens and Subsequent Cataract by Shot from an Air Gun..... | 88 |
| WILSON, HAROLD. Senega in Treatment of Hyperphoria,—A Criticism..... | 155 |
| — The Study and Correction of Heterophoria..... | 227 |
| WOODVINE, D. G. New Suggestions in the Treatment of Constrictions of the Œsophagus..... | 278 |
| Word-Blindness and its Concomitants. H. H. Crippen and F. F. Casseday..... | 89, 178 |

THE JOURNAL OF OPHTHALMOLOGY, OTOLOGY AND LARYNGOLOGY.

EDITOR,
CHARLES DEADY, M. D.

ASSOCIATE EDITORS,
H. H. CRIPPEN, M. D.
H. F. IVINS, M. D.

SENEGA IN THE TREATMENT OF HYPERPHORIA AND ITS RESULTANT SYMPTOMS.

BY E. H. LINNELL, M. D., NORWICH, CONN.

Since reading an article published in the JOURNAL OF OPHTHALMOLOGY, OTOLOGY AND LARYNGOLOGY for April, 1889, by the late Dr. George S. Norton, in which he suggested senega as a valuable remedy in the treatment of weakness or paralysis of the ocular muscles, and especially of hyperphoria, I have used it extensively in my practice. I have lately been making a critical analysis of cases in which I have prescribed it, with a view of verifying its pathogenetic symptoms and arriving at more exact indications for its employment, and of bringing again to the notice of the profession a remedy which is worthy of more general employment. Although I refer especially to hyperphoria in the present paper, senega is also of value in other varieties of heterophoria and in eye strain from errors of refraction. I have selected from my clinical records seventeen cases as illustrating its sphere of usefulness, including some where it was not markedly beneficial. In nearly all of them es. or ex., or both, existed in connection with hyperphoria. They would be much more valuable had they all been treated by the remedy alone without other means, but I hope to be able to substantiate the claims made for it by Dr. Norton and to demonstrate conclusively that in senega we have a very valuable remedy for the cure of deviating

tendencies of the eyes in a vertical direction, and for the relief of the distressing symptoms arising from such a cause. I have endeavored to point out specific subjective indications for its use, but in the absence of definite indications for this or some other remedy, the objective symptom of hyperphoria alone determines its prescription and usually with gratifying results. I believe the tendency is too strong to treat such cases by tenotomy, and I am satisfied that the method of treatment outlined in the subjoined cases will cure the majority, or if it does not radically cure them it will relieve the annoying symptoms and give better satisfaction both to the physician and the patient than the indiscriminate cutting of tendons that is advocated by some oculists. Of course there is a small minority of cases where tenotomy is indicated, but in the course of quite an extended experience I have met with very few where I considered it advisable. If this paper shall encourage a similar opinion in others and a more persevering trial of systematic exercise in connection with suitable remedies, holding tenotomy as a *dernier ressort*, I shall be gratified.

CASE I. L. A., aged seventeen, a student. Hypermetropia; complains of pain and blurring of vision after moderate use of eyes. Conjunctivitis with smarting in lids. Plus 48^s for near work relieved her. One year later she returned, saying her eyes had been much better, but that she had lately been studying hard and that her eyes were again painful. Refraction was the same as before. The phorometer now showed Ex. $\frac{1}{2}^{\circ}$ and in accom. $6\frac{1}{2}^{\circ}$, R. int. 12° , L. int. 16° , each ext. 12° . The same glasses were continued and systematic exercise with prisms and faradism was used. She was discharged in two weeks with each int. overcoming a prism of 30° easily. She returned in six months saying her eyes had been all right until recently, when, after some use, she had again asthenopic symptoms. Now examination showed Rh. $\frac{1}{2}^{\circ}$, Ex. $1\frac{1}{2}^{\circ}$, and in accom. 3° , R. int. 30° , L. int. 32° . Systematic exercise for the vertical as well as int. recti was again practiced, together with faradism and senega 1x. In ten days she had orthophoria far and near with convergence of 60° and no asthenopia, and has had no relapse after more than a year.

CASE II. Mrs. M., middle age. Myopic astigmatism with Pr. Complains of pain back of eyes and in temples and considerable lachrymation, all < by use. Nat. mur., and correction of refraction produced considerable improvement, but pain in right eye soon returned and examination showed Rh. 1° . Senega 6x was given with prompt relief. Six months later she reported that her eyes had given her no further trouble. No examination was made.

CASE III. Hyperopic astigmatism; Lh. 5° , Es. 2° . Constant diplopia. Always subject to frequent headaches < by fatigue or excitement. Weight in occiput, pain in left eye, heaviness of lids, and drowsiness. Diplopia intermittently for a year, last few weeks constant, and headaches more frequent. Prescribed gels. 6x every three hours and exercise of ext. Right eye stands too low and turns in; has diplopia to the right of middle line. In ten days her head was better, there was no esophoria, and left hyperphoria was 3° . Continued treatment. After another week diplopia was less troublesome, but Lh. was again 5° . Gels. 1x. After ten days more Lh = 4° ; after exercise with prisms in office 2° . R̄ Senega 6x and wear prism 2° base down, left eye, to partially correct the hyperphoria and give incentive to overcome it. After one week returned with improvement in headache and not much diplopia. Continued senega and wear prism only occasionally when diplopia is specially annoying. After two weeks head continued better and diplopia disappeared, but hyperphoria remained 3° . Could be temporarily reduced to 1° by practice with prisms in the office. R̄ Rhus and wear prisms constantly. Tenotomy was advised and declined. This treatment gave great relief, and hyperphoria (manifest) was never more than 3° and did not increase under the use of a partially correcting prism. The use of the prisms was discontinued after two months and the headache and diplopia returned after a few days, but hyperphoria remained 3° . The use of the prism again promptly relieved the headache and diplopia without medicine. One year later she reported that she had only had occasional headaches. She did not wear glasses in the house, but was obliged to do so when out of doors. The phorometer now showed Lh. only $1\frac{1}{2}^{\circ}$. A hyperopic astigmatism of .25 D. was now corrected (it had not been previously, because she declined to use atropia) and these lenses were worn constantly, combined with a prism of $1\frac{1}{2}^{\circ}$ base

down, left eye. She had very little trouble for a year, when the eyes again became painful and Lh. was $2\frac{1}{2}^{\circ}$. The same glasses were continued, but a pair of spectacles with prism 2° base down, right eye, and 1° base up, left eye, were given to be worn daily for an hour or more for practice. After two weeks Lh. was the same; prisms were discontinued for practice and senega 1x 2 gtt. four times daily prescribed. This prescription relieved her so that she did not return for eight months. She then complained of confused vision and vertigo when turning her head, while lying down, on getting up, or when stooping. Lh = 2° , refraction the same; no lateral deviation far or near. R Wear prism 2° with cylinders constantly and take conium. She has not been seen since June 7, 1892.

CASE IV. Hyper-esophoria. Much headache < by use of eyes. Nervous prostration. Rh. 3° , Es. 6° . Plus 18s for near work. Faradism, practice with prisms, and senega cured. Treatment was irregular, hence longer than usual. Finally orthophoria far and near and no asthenopia.

CASE V. One of Dr. Stevens' cases, upon whom he twice made tenotomy without benefit. He wished to operate twice more, but the patient declined and consulted me. He never remembers when his head did not ache. Pain in the occiput and behind the eyes; very nervous. He had compound hypermetropic astigmatism. The muscular condition varied greatly at different examinations, showing much unsteadiness of the muscles. Suitable glasses together with onosmodium, arg. nit., conium, or nux, as indicated, gave him great relief. Some months later the phorometer demonstrated Lh. 4° , Es. 2° , Ex. in accom. 5° . Under the use of senega 6x and systematic exercise, in one week hyperphoria was only 1° , Es. less than 10, but Ex. in accom. 6° . He was under treatment for a considerable time. Senega was discontinued, and under onos. and systematic exercise the hyperphoria entirely disappeared, also the Ex. in accom. Es. $\frac{1}{2}^{\circ}$ remained at last examination, nearly a year ago. He was then using his eyes nearly all day, and sometimes half the night, without discomfort. In this case senega was not of much benefit, because not well indicated, but the case is of interest as showing the results to be obtained by exercise and remedies in a severe case after tenotomy had been tried without benefit.

CASE VI. M. Am. Frequent headaches; eyes tire easily. R — 3.00 Ds., C — .50 Dc., ax. 90° O. D. and same ax. 60°

O. S. gives relief, aided by phos. and, later, mellilotus. Three months later headache returned and was not relieved by remedies. Examination with phorometer now showed Lh. 5° , Es. 10° , Ex. in accom. 2° . After one month's treatment with prisms and electricity she had orthophoria far and near. Adduction = 52° , sursumduction = 4° , and she was free from headache. She has remained well ever since, now eighteen months, going to school and using her eyes freely. Senega was used in this case for only about four days and without perceptible improvement. No medicine was taken during most of the time she was under treatment.

CASE VII. M. Am. Lh. $2\frac{1}{2}^{\circ}$, Es. 2° . Chronic headache, severe pain (not accurately described) after using eyes. My usual treatment with prisms and electricity was instituted and without internal medication at first. Later she complained of pain in the occiput and left side of head, for which she received onosmodium 3x. For two months she had no severe headache, then the phorometer showed Lh. 1° . She complained of tension over the eyes after near work for a short time, and I prescribed arg. met. 2° . Treatment with prisms was continued at her home, and three months later she wrote that her eyes were much better and that adduction was 52° with each eye. Ten days later I had an opportunity of examining her, and found orthophoria far and near. She again called at the office, after three months, and reported that she used her eyes pretty well and had had no severe headache, but overuse caused pain in the temples. She then had Lh. 1° , Ex. in accom. $\frac{1}{2}^{\circ}$, adduction = 60° , abduction R = 8° , L. = 10° , sursumduction = 4° . R Senega. The next day there was no hyperphoria, and Ex. in accom. was 4° . That was in December, 1890. I have not seen her since; but, in response to a letter addressed to her since commencing this paper, she wrote me that she very rarely had a headache, and for a long time had been able to use her eyes freely without discomfort.

CASE VIII. H. Ah. Lh. 8° . Glasses given to correct the error of refraction were comfortable for reading, but the nearly constant headache, from which he had suffered for a long time, continued and was aggravated by the use of the eyes. He had pain over the eyes and a pressing out sensation in both temples. I prescribed senega 6x. In five days Lh. was less than 1° , but the headache was no better. Adduction = 16° , abduction = 6° O. U. Continued senega with no other treatment. In five days more

his headache was better, and Lh. was the same. Three weeks later the headache continued and was then more severe in occiput. Lh. = 1° , slight Ex. I then gave him a prism of 1° base down O. S. in combination with the cylinders previously prescribed, and mellilotus ix. He was without glasses nine days, and then presented with more severe headache. He complained of pressure over each eye and much photophobia. Conium 6x was prescribed, and one week later he reported his "head better and glasses fine." Ten days afterward the head continued better, but Lh. was 2° and Ex. 1° . Galvanism was used once and conium continued. One week later Lh. was again reduced to 1° , and Ex. 1° , but the headache was more severe. Conium 30x was given him, and two weeks later he was free from headache. The remedy was continued, and after three weeks he reported slight return of headache; could use his eyes half an hour at a time. More than that caused pain in the supraorbital region, and feeling as of sticks in the eyes. He had orthophoria far and near with his glasses. \mathcal{R} Nat. mur. Six months later he was about the same; Lh. 1° with his spectacles. He was not seen again for two years, and during this time his eyes had been pretty comfortable, though not very strong. He had been free from headache, except after overuse of eyes. Without his glasses the phorometer showed Lh. $1\frac{1}{2}^{\circ}$, Ex. $1\frac{1}{2}^{\circ}$.

CASE IX. H. Ah. Lh. $\frac{1}{2}^{\circ}$, Ex. $2\frac{1}{2}^{\circ}$. Orthophoria in accom. Severe neurasthenia and general debility. She had never been able to use her eyes with comfort. She had much pain in occiput, extending down between her shoulders; pain and strained feeling in her eyes. She lived out of town and there was no opportunity for systematic exercise. Cim. gave some relief. Glasses were given to correct the error of refraction, but she did not use them with comfort and complained of nausea after near work for a short time. Jab. was given for these symptoms. After three months, during which she had worn her glasses intermittently, she complained of pain and soreness in her right eye and in the head and occiput on the right side. \mathcal{R} Senega ix. After six weeks, reports: "I wear my glasses constantly, and feel that I could not get along without them. I am nearly free from headache, and use my eyes freely." Senega 6x. Lh. still $\frac{1}{2}^{\circ}$, Ex. in accom. 8° .

CASE X. Bookkeeper. Hm. Lh. $\frac{1}{2}^{\circ}$, Es. 1° , Ex. in accom. 1° .

R + 60^s for near work and senega. One year later no hyperphoria ; Es. 3°, orthophoria in accom.

CASE XI. Miss F., age seventeen, student. Am. Rh. $\frac{1}{2}^{\circ}$, Ex. in accom. $1\frac{1}{2}^{\circ}$. Slight asthenopia and occasional headaches after using eyes. R Senega 6x and systematic exercise. In one month uses eyes with much more comfort. Rh. still $\frac{1}{2}^{\circ}$, Ex. in accom. 1°. Senega 1x. After three weeks orthophoria far and near and uses eyes without slightest discomfort. Three months later the same.

CASE XII. Spasm of accom. Apparent Am. After atropia H. O. D. H. Ah. O. S. Rh. Ex. in accom. Chronic headaches. Never free from pain in head and eyes. Dull pain in eyeballs. Eyes feel strained and lids heavy. Photophobia and dull pain in whole head. Hyperæmia of retinae, especially left ; disks blurry. The muscular condition was not accurately tested. Glasses for constant use. Onos., physostigma, and spig. relieved her so that she was free from headache for two years. A slight change in glasses and onos. cured her again for four years. She again came under treatment in January, 1892. Refraction then was as previously. Within the last two weeks, for the first time in four years, she has had pain in the back and left side of her head. She was very nervous and had also much pain in the small of her back. Rh. = 1°. Ex. in accom. 12°, all verticals = 2°. R Onos., electricity, and practice with prisms. In two days she was free from headache. After eight days Rh. $\frac{1}{2}^{\circ}$, Ex. in accom. same. Senega 6x was now prescribed and exercise continued. After nine days more Rh. same. Ex. in accom. 8°. Senega 1x. In another week no hyperphoria (she wore vertically refracting prisms each day at home during this week), but more headache. Senega 6x. After three weeks she reported : "No headache and able to use my eyes freely." Ex. in accom. 7° ; continued treatment. After four days more Ex. in accom. $3\frac{1}{2}^{\circ}$; discontinue use of vertical prisms and wear 8° base out O. U. half an hour daily. Continued senega 6x. After four days again Rh. $\frac{3}{4}^{\circ}$; orthophoria near. Now use both vertical and lateral prisms. In ten days Rh. $\frac{1}{2}^{\circ}$; orthophoria near. Continue prisms and take senega 1x. In eight days a good deal of headache, but orthophoria far and near. Each int. = 32°. Senega 6x. Two weeks later orthophoria far and near. Discharged and when last heard from continued all right.

CASE XIII. Lawyer. Myopic astigmatism. Frequent head-

aches from eye strain, relieved by glasses and remedies. Was treated at intervals for several years. Never had unrestrained use of eyes. Onos. was frequently helpful. June 27, 1890, my record reads : Rh. 1° , Ex. 2° , in accom. 4° . R Onos. and galvanism. In three days he had orthophoria far and near. Treatment was continued at irregular intervals for one month, when each int. = 30° instead of 10° and 14° , as at first. Then he was discharged with senega 6x. After one month, during which he was off on a vacation and eyes were pretty comfortable, he still had orthophoria, but a latent Rh. was suspected. Treatment with prisms and galvanism was resumed and senega continued some weeks until all verticals = 4° and the eyes were used comfortably. He came again March 30, 1891, with Rh. $\frac{1}{2}^{\circ}$, Ex. $\frac{1}{2}^{\circ}$, Ex. in accom. 2° . Agaricus was prescribed, and after taking it for one month in connection with the use of prisms and electricity, the condition was rather worse. Rh. = 1° , Ex. in accom. 6° . I gave him senega 1x and discontinued all other treatment. He was soon able to use his eyes comfortably, and in one month Rh. = $\frac{1}{2}^{\circ}$. He did not consult me again for seven months, when there was no hyperphoria, and Ex. = 1° . Two months later he had again Rh. $\frac{1}{2}^{\circ}$. Senega 6x with faradism brought orthophoria in twelve days, and there has been no further relapse now for six months.

CASE XIV. Had facial paralysis cured by agaricus. Mixed astigmatism O. D., simple hyperopic astigmatism O. S. Slight asthenopic symptoms, not accurately recorded. Rh. = 4° . Senega 1x. In three days (without other treatment) Rh. = $2\frac{1}{2}^{\circ}$. Continued senega with systematic exercise. In ten days Rh. $1\frac{1}{2}^{\circ}$. Senega 1x. After three days more Rh. $2\frac{1}{2}^{\circ}$. Continued senega and wear prism 2° base up, left eye. Six months later (since commencing this paper) Rh. = $3\frac{1}{2}^{\circ}$. Complains a good deal of asthenopic symptoms again.

CASE XV. Mixed astigmatism O. U. No asthenopia, but Rh. = $\frac{1}{2}^{\circ}$, Ex. = 10° . Under atropia, Rh. 1° , Ex. 8° . Corrected refraction and prescribed senega 1x with no other treatment, and after wearing glasses and taking the remedy three weeks there was orthophoria far and near.

CASE XVI. Had chronic headache < by using eyes, dull pain over eyes, and burning in eyeballs. Hyperopic astigmatism O. D. H. Ah. O. S. Ex. 1° , in accom. 6° . Under atropia Lh. $\frac{1}{2}^{\circ}$; no

exophoria. R Ruta and wear vertical prisms for exercise. After eight days there was no improvement. Lh. as before ; Ex. in accom. $1\frac{1}{2}^{\circ}$. She was then given a prism of $\frac{1}{2}^{\circ}$, with base up before the right eye, combined with suitable cylindrical lenses for constant use. Senega 6x was prescribed, and treatment with prisms and faradism was continued. In ten days there was orthophoria far and near (with her glasses). It is now three months since treatment was discontinued and she has had no return of headache or asthenopia.

CASE XVII. H. Ah. Frequent headache over eyes < by using them. Glasses relieved her very much, but she still had some headache. Es. $\frac{1}{2}^{\circ}$, Ex. in accom. 2° . R Senega 1x for suspected latent hyperphoria. One week later she reported that she had been almost free from headache since the third dose. She continued free from headache four months, when the pain returned, and then examination showed Lh. $\frac{1}{2}^{\circ}$, Ex. in accom. 10° . Senega 6x was given, and she has not been seen since.

ANALYSIS OF CASES.

An analysis of the foregoing cases gives us the following results: In Case I a Rh. of $\frac{1}{2}^{\circ}$, Ex. of $1\frac{1}{2}^{\circ}$ and of 3° in accom. was cured, and also the accompanying asthenopia (orthophoria being established) in ten days by senega 1x, systematic exercise, and faradism.

In Case II Rh. of 1° and the resultant symptoms were promptly cured by senega 6x without other treatment.

In Case III a Lh. of 5° was reduced to 2° , and an Es. of 2° cured by the "mixed treatment." The improvement was more satisfactory while taking senega than at other times. Treatment was quite prolonged and the result quite satisfactory, but it was impossible to estimate to what extent the remedy contributed to the end attained.

In Case IV Rh. 3° and Es. 6° was cured by faradism, exercise, and senega, but here again it was difficult to judge of the individual value of the separate factors in the treatment.

In Cases V and VI senega was of no apparent service.

In Case VII senega was followed by prompt and per-

manent relief of asthenopia after the heterophoria had been in a large measure removed by other treatment.

In Case VIII Lh. 8° was reduced to 1° in five days by the remedy alone. Other remedies were necessary to relieve the asthenopia, but the diminution of Lh. was permanent.

In Case IX the effect of the remedy was directly the opposite of the preceding. The asthenopia was promptly relieved, but the hyperphoria (only $\frac{1}{2}^{\circ}$) was uninfluenced.

In Case X a Lh. of $\frac{1}{2}^{\circ}$, unaccompanied by asthenopia, disappeared under the exhibition of the remedy.

In Case XI we had a Rh. of $\frac{1}{2}^{\circ}$ and an Ex. in accom. of $1\frac{1}{2}^{\circ}$ cured. After three weeks of mixed treatment we had orthophoria far and near. The improvement was more marked while taking senega ix, and it seems fair to give the credit in large measure to the drug.

In Case XII senega ix cured the hyperphoria, but increased the headache. Senega 6x relieved the headache, but while taking it the Rh. returned. By alternation of the two potencies at intervals of some days a cure resulted. Prisms were used in addition, but no improvement resulted from the exercise, except when senega was taken at the same time.

In Case XIII the treatment extended over a long period, and was attended by frequent relapses. More satisfactory and permanent results were obtained while taking senega.

In Case XIV Rh. 4° was reduced to $2\frac{1}{2}^{\circ}$ by senega ix, and in two weeks it was still further reduced to $1\frac{1}{2}^{\circ}$. During this time prisms and faradism were employed four times. They were not used during the first three days.

In Case XV the remedy was used without other treatment. Rh. 1° and Ex. 10° were cured, orthophoria far and near resulting in three weeks.

In Case XVI a cure was effected by the "mixed treatment," and again the influence of the remedy could not be accurately estimated.

In Case XVII the remedy was used alone. Very marked relief of subjective symptoms after third dose of senega ix and no return of headache for four months.

RÉSUMÉ.

Cases II, VIII, IX, X, XV, and XVII were cured by the medicine alone, and hyperphoria of from $\frac{1}{2}^{\circ}$ to 6° disappeared. In the other cases additional treatment was employed. In Cases V and VI the remedy seemed to be of little or no benefit.

In five cases treated with prisms and electricity the improvement was much more satisfactory while taking senega, so that it seemed fair to attribute a decidedly curative influence to the medicine. Thus in eleven out of seventeen cases we find positive benefit from senega, and in four more satisfactory results were obtained from the mixed treatment, but the value of the remedy could not be satisfactorily determined.

The following symptoms were either cured or greatly relieved by it, viz., "Pain in the eyes after reading." "Pain behind the eyes < in right and < by use." "Chronic headaches; severe pain (character not defined) after using eyes." "Use of eyes causes pain in temples." "Pain and soreness in right eye and in head and occiput on right side." "Headache (not defined) after using eyes." "Frequent headaches over eyes < by using them."

I regret that the subjective sensations were not more frequently and accurately recorded, simply headache or asthenopia being sometimes noted. In one case senega ix invariably increased the headache, although relieving the hyperphoria, while senega 6x relieved the headache, but did not correct the hyperphoria. Many other symptoms found in Allen and quoted by Norton were relieved by the mixed treatment, but I have mentioned only those where the relief could be directly attributed to the medicine alone.

Senega may be compared with onos., ruta, gels., argent. nit., and met. in the class of cases under discussion, but the limits of this paper forbid more than a mention of them.

PSEUDO-SYPHILITIC LESIONS OF THE FAUCES AND PHARYNX.

BY WILLIAM R. KING, M. D., WASHINGTON, D. C.*

It may well be said we have enough genuine, or true, lesions of a syphilitic character without taking up so-called false ones; however, my excuse for ringing the changes on this topic must be especial interest in the subject, engendered by the two rather unusual cases which will be recounted in the course of this paper.

The fact that syphilitic symptoms are simulated closely in cases of mercurial poisoning is, of course, an old story to the profession, especially in the homeopathic ranks thereof, yet when the poisoning is not suspected by, or apparent to either the patient or physician, and when exposure to such influence extends over a long period of time—months and even years—there is some room for excuse if the diagnosis and treatment be both faulty and directed to conditions not actually present.

The constant absorption of mercury, in some form, by the mucous membranes, with which it comes in contact, will differ materially in degree in all cases. The amount presented will vary, as well as the power of absorption; then, again, the results of the absorption of this metallic poison will vary in different cases, as may be readily shown by proving drugs: rarely do two provers have identical lines of symptoms. The chief conditions produced by the drug will naturally be present in all cases, but many of the other and less characteristic symptoms will vary in all cases, owing to

* Washington Homeopathic Medical Society, October, 1892.

individual idiosyncrasy. Hence we may readily see that patients exposed to mercurial poisoning may present varying symptoms, yet there will always be some characteristic conditions which must eventually let in the light and render a correct diagnosis possible.

The possibility of such accidental chronic poisoning was rather rudely and forcibly presented to me some six years ago by the presentation of a case for diagnosis and treatment, brought in by one of my colleagues. This case I will report as follows :

Mr. C., æt. about fifty-eight, living near Chicago, has visited several physicians of that city, but has obtained no relief and is steadily growing worse. Business calling him East, he came to Washington and has been treated by several of our local practitioners, finally calling upon the physician who brought him to my office for examination and consultation. He complains of dysphagia, almost complete inability to swallow, articulation very difficult of accomplishment and decidedly imperfect, some small spots of shallow ulceration on the pillars of the fauces, both sides, and one on the uvula. Muscular coat of fauces and pharynx seemed completely paralyzed and useless, flabby and flaccid. A great amount of saliva being constantly secreted, increased his discomfort, as he could swallow it only with great difficulty, and it would flow from his mouth in a stream. He further spoke of a constant metallic taste.

The history of the treatment he had received and the undoubted ability of many who had already fruitlessly prescribed for him, led me to suspect and to look for some subtle cause, as yet not discovered.

Many of the symptoms and the appearance of the ulcerations made a diagnosis of specific lesion the first to be thought of ; he, however, strenuously denied any possibility thereof. This in connection with the fact that he had been undoubtedly under anti-syphilitic remedies without obtaining relief, made me hesitate about prescribing them ; however, on general principles, mercurius jod. flav. 3x was given him, and he was told to report in three days. This he did and was decidedly worse, saying my medicine had behaved just as much already taken had done.

On examining his throat on this occasion my attention was

attracted to a large and coarse rubber dental plate on the upper jaw, and asking him to remove it, I examined it closely and felt convinced that the cause of all our trouble was there. The plate was a cheap one, made by a dentist in a small town in Illinois, very rough, porous, and improperly vulcanized. I sent him with it to an eminent analytical chemist, who, after analysis, reported that the plate was loaded with cinnabar and was improperly vulcanized, undoubtedly permitting the escape of the free mercury into the buccal cavity through the porous condition of this plate. He was given a small supply of potassium iodide and provided immediately with gold plates ; this was followed by prompt and steady improvement ; the salivation stopped, dysphagia improved, as well as articulation, and the ulcers healed readily and kindly. No medicine was given after improvement was thoroughly and certainly established.

This was, in my mind, an undoubted case of chronic mercurial poisoning, presenting many symptoms simulating the second stage of syphilis. He had been treated on this basis, with the sole result of adding fuel to the fire. When the poison was removed almost complete recovery resulted ; he never obtained complete control of the muscles governing articulation, however. I have since learned he died three years later from apoplexy.

With your indulgence I will present an even more severe and interesting case, one which came under my observation and care more recently.

Mrs. G., aet. thirty-two, married and the mother of two children, was sent to my office for diagnosis and treatment by a brother physician. History of sore throat for a protracted period, five or six weeks, rapidly getting worse and resisting all treatment. Found her weak, emaciated, and very nervous ; on examining the throat I found it anæmic, with extensive ulceration of the fauces, both sides, and of the soft palate. The uvula was entirely absent, having sloughed off a few days before ; articulation and deglutition were very difficult, owing to loss of tissue and to pain.

On first examination I refused to make a definite diagnosis,

being unable to determine between syphilis, epithelioma, and tuberculosis.

Within a few days epithelioma was excluded, owing to the absence of the characteristic pain and odor usually accompanying this disease. The obtaining of a careful history served to exclude the probability of syphilis, at least of the acquired form, and I was for a time forced to consider the case one of tubercular pharyngitis, particularly because of some rise of temperature, at times as high as 99.8° , of the extreme anæmia and loss of flesh, together with occasional night sweats, although with this there was no laryngeal or pulmonary complication demonstrable, though there was a suspicious family history. The introduction of remedies and a nutritious diet, however, resulted in nothing, and I again was forced to think of syphilis as the cause, owing to the suspicious symptoms intensely characteristic of this constitutional poison; so in spite of the clean history the administration of mercury was begun. Immediate disappointment followed, my patient becoming much worse under this remedy. Under arsenic. jod. 3x there had been some temporary benefit, and the ulcers would nearly heal, only to break out afresh, however, and this remedy must needs be shelved.

The patient was becoming desperate and so was the doctor; finally, having become very weak and debilitated, she was unable to come to my office. On a visit to her house, while examining her throat, I saw what I never had been allowed to see before, namely, a dark, reddish-brown plate covering the entire hard and part of the soft palate. This she had always removed on former examinations at my office, but on this occasion forgot it. I immediately asked to see it and was impressed by its cheap appearance and the evidence of imperfect workmanship. On inquiry I discovered she had been wearing it for three or four years, having procured it at her former home in Ohio. She was immediately sent to a reliable dentist with a note from me requesting analysis and a report. This came in due time and settled my suspicions—the plate was full of red oxide of mercury and so porous that there was no possibility of doubt as to its escape into the mouth with consequent absorption.

Feeling that the problem was solved, she was instructed to throw away this plate, and she procured a gold one; however, I was disappointed not to obtain immediate improvement, and, in

fact, became doubtful whether the correct cause had been discovered.

The ulcers would heal and all would look well for a day or two, when suddenly the soft parts would appear studded with yellowish white, tubercle-like masses ; these would break down and ulcerate, and then again heal over. This continued for some time until, owing to uterine complications of a painful nature, she was turned over to the care of her family physician : for this condition she received mainly mechanical treatment and rest in bed. The throat continued much the same, and finally, owing to the severe and intractable pain, she was given morphine in increasing doses.

When hope had about deserted all connected with the case, some weeks following the change of plates, she began to improve ; no remedies were given her before or after this, except the morphine to allay intense pain and nervousness ; this was soon discontinued. Nutritious and careful diet constituted her treatment, complete recovery resulting. In three months she had gained twenty pounds and looked like a different person ; within eighteen months thereafter she gave birth to a hearty and healthy child. The soft parts in the throat healed over nicely ; and, strangest of all, a new, though imperfect, soft palate and uvula have developed, plastic baby tissue being thrown out until a rudimentary structure was thus formed to take the place of that destroyed.

The fact that the benefit from removing the mercurial plate was slow in manifesting itself in this case, can be accounted for by the profound condition of poisoning and the extreme anæmia. When, however, it did begin it was rapid and without the assistance of medicine.

The lady is convinced that she must have died had not the plate been changed, and cannot denounce too strongly the practice of some careless and ignorant dentists who use such material in the manufacture of tooth plates.

I do not know what the practice is now, but a few years ago, I am convinced, many dentists used such plates where a cheap article was required. The danger of this procedure is patent even to the layman, when he is told of its exist-

ence ; in fact, to my mind, it is criminal, and when discovered it should be exposed and the guilty party prosecuted.

Had I the time and space I could recount, briefly, two mild cases of a similar nature ; but as these were discovered in the earlier stages nothing new would be presented.

Such cases may be common in the practice of my colleagues, but they have been rare enough in mine to prove most interesting, particularly as the cause of the trouble was stumbled upon in the above cases, and the result of its removal so satisfactory to all concerned.

Since writing the above I have been informed that one of our local dentists has to some extent recognized this dangerous condition of things and for its relief offers a plate as ordinarily constructed, covered or plated with gold, thus obtaining the safety of the gold plate without the expense of a solid one.

Aluminum as a metal for the manufacture of tooth plates is fast losing ground, as it has been demonstrated that injurious results to the general health have followed its use owing to the generation of something deleterious, I know not what, when in contact with the secretions of the mouth.

SOUND AS A FACTOR IN THE TREATMENT OF DISEASE OF THE SOUND-CONDUCTING AP- PARATUS.

BY HENRY C. HOUGHTON, M. D.

Sound is an essential force in nature, or, if you please, one of the manifestations of the one great force which is manifest, as heat, light, electricity, magnetism, gravitation, etc. We will leave it to the philosophers to tell us what force is, but the theories advanced to explain the phenomena of "sound," as a force, are of interest to us. The former theory was that sound as a sensation was the result of air waves which put in motion the drumhead and related bones, thereby communicating waves or oscillations to the fluids in the labyrinth, and from the terminal filaments of the auditory nerve floating in those fluids, the impulse was translated to brain centers, giving the sensation of sound.

A more recent hypothesis advances the idea that sound is an essential force, like light, heat, magnetism, electricity in its various forms, and there are some phenomena which are explained by such an hypothesis. Looking at sound as a cause, the effects produced are good or bad according to the circumstances which exist when the exciting cause is sufficient to produce an observable effect. Sound, acting upon a normal conducting apparatus, usually produces only good effects, so that the subject is not aware of any defect or deviation from perfect function. Sound may be the cause of discomfort, then of functional disturbance, and eventually of abnormal conditions which become permanent. A normal ear, under ordinary conditions, will give perfect

function through the entire period of life, and should no more fail than should the eye. Old age should have perfect hearing as well as perfect sight.

The uncomfortable subjective symptoms which arise from the effect of sound are due to such causes as are active in the well recognized boiler-maker's deafness, in which the cause is excessive action of a normal apparatus; subjective sounds also are due to the action of causes that are not excessive, acting upon an abnormal apparatus changed by catarrh or suppurative disease.

The rationale of deafness and subjective sounds is simple; the conducting apparatus lying between the canal and the auditory nerve has been subjected to various changes, usually characterized as "hardening," the result of catarrhal inflammation, suppurative inflammation, rheumatism, or gout. This rigidity causes inward pressure upon the fluids of the labyrinth, mainly at the oval window, thereby changing the normal tension of the labyrinthine fluids, and theoretically modifying the tuning of the apparatus to the circulation of the part; at least this is the best hypothesis which aurists have yet offered for the phenomena of subjective sounds.

The necessity is a clear one, and the indications for treatment equally clear, namely: to overcome the rigidity caused by disease, and restore the mobility of the parts. The history of attempts to meet this necessity is a long one and full of interesting mechanical devices offered by various aurists in England, on the continent, and in this country. Efforts to open the eustachian tube are among the earliest. The eustachian catheter, Politzer's method of inflation, Valsalva's experiment, are all well known, and each of them effective. The devices intended to move the drumhead and ossicula by direct action upon the surface of the drumhead, either in conjunction with inflation or independent of it, are included in another group. The suction apparatus, such as a stomach pump, causing excursions to and fro of the drumhead, Lucae's stempel, and Siegel's otoscope are suggestive instruments.

These all offered some hope of improvement, but all these instruments are crude and coarse in their application.

THE PRESENT STATE OF TREATMENT.

The first advance over the above cruder methods that came to my attention was that of J. Maloney of Washington, D. C., called "otacoustic treatment," which was presented to the American Otological Society some years since, but it failed to make a wide impression upon the profession, possibly because this gentleman protected his interests by a patent covering the device. My attention was again called, later on, to an article by Dr. King of our own school. Since then Professor Henry F. Garey of Baltimore has utilized the phonograph for the same purpose that Maloney used his conversation tube, and thereby has given the whole subject of aural massage a very great impetus. The sound pulses, as produced by the diaphragm of the phonograph, conveyed by the stethoscopic tube to the canal and drumhead, produce an appreciable massage, which is made evident by congestion of the drumhead, increased mobility of the same, subjective symptoms in the way of increased heat, and modification of the subjective tones.

This new departure of Professor Garey's has produced an interested experimentation on the part of a good many observers, and several attempts have been made to produce the same effects as are produced by the phonograph, experimenters utilizing musical instruments. Professor Garey's "vibrometer," so called, consists of an instrument similar to a banjo, with strings, frets, and a vibrating wheel similar to a hurdy-gurdy attachment; this acting upon the strings over a resonating chamber, the sound impulses are conveyed to the canal and drumhead by stethoscopic tubes similar to those used on the phonograph.

I have been using since last June a reed instrument for the same purpose, and find that the effects are much the same.

Dr. Wilson of Meriden, Conn., writes me that he used a guitar, and later on a reed instrument for the same purpose.

In closing this article it may be well to give a brief summary of the effects produced: On the canal and drum-head, heat, itching, redness. The heat should be considered an indication that the sitting has been sufficiently prolonged. The itching is more or less pronounced, transient in some cases and long continued in other cases, causing the patient to rub at the ears and complain of the annoyance for hours. The redness is usually quite marked at the inner third of the canal, at the periphery of the drumhead, over Shrapnell's membrane, and along the manubrium plexus. The head generally becomes more or less sore, soreness of the scalp, of the muscles attaching to the aponeurosis of the temporal bone, in a number of cases extending to the occiput, and in one to the neck and shoulders. Increased mucous secretion has been observed in a number of cases, one very marked. Upon the acoustic nerve we note relief of subjective sounds, without increase of hearing for the watch or the voice. Relief of subjective sounds, with increase of hearing for watch and voice. Increase of the audition, without increase of the subjective sounds. Peculiar response of the auditory nerve is noticeable. As a rule, we notice failure for the high tones is more marked than for the low tones. In some cases the perception of the higher tones is not well defined. There is a perception, but it is not clear and sharp, two or three consecutive notes sounding very much alike. In one case the higher tones were not clearly defined until we had passed over the two octaves, or an octave and a half, two or three times, dwelling on each vibration. Then the perception came out clear.

The action of such remedies as causticum and chenopodium, in my judgment, has been very much increased by aural massage.

My conviction that we have in this new method a very valuable adjuvant to previous methods of treatment, has been deepened and strengthened by further study and experiment, and it is gratifying to note that a large number of our school are very much engaged in study and experiment along this line.

ANISOMETROPIA.

BY W. H. BIGLER, M. D., PHILADELPHIA.*

Besides the usual forms of ametropia so common at the present day as causes of eye strain and headaches in which the departure from the normal is the same in the two eyes, we have a not uncommon condition in which there is a difference in the refraction of the two eyes of greater or less degree, and to this the name of anisometropia has been given.

A condition is often noted which at first would seem to depend upon difference in refraction, but which on more careful testing proves to be a difference only in acuity of vision in the eyes.

Again, before the use of a mydriatic, this condition may be simulated by a difference in power of accommodation, the ciliary muscle more readily overcoming a refractive error in the one eye than it is able to do in the other.

Leaving out of view, then, these two classes of cases, we still have not a few where the difference lies in the refraction, discoverable most surely by the use of a mydriatic, and often giving rise to most distressing symptoms of asthenopia. Except in those cases where this condition is the result of an operation, the question as to the cause of this form of ametropia is not yet in a condition to be answered. Although an investigation of this point could not but prove interesting, all we can say at present is that while in the majority of cases it is undoubtedly congenital, in many it can be traced with tolerable directness to the

* Homeopathic Medical Society of the State of Pennsylvania.

varied conditions, favorable or otherwise, attending the use of the eyes during the period of infancy, childhood, and youth, while the as yet pliable and unhardened structures of the eyeball are capable of being molded by external influences, principally mechanical, acting upon them from without through the several external recti muscles or the eyelids.

Since perfect symmetry between the two lateral halves of the human body is rather the exception than the rule, we need not be surprised to find the same hold good in regard to the eyes. While the want of the same facility in the use of the two hands in those who are not ambidextrous corresponds to the difference in the acuity of vision of the two eyes, the difference in size or shape of the respective parts of the two hands or feet will correspond to the condition of anisometropia in the optic organs.

What prenatal, internatal, or immediate postnatal influences bring this about it is impossible to decide. We all recognize the effects of the various kinds and degrees of exercise upon the development of the other organs of the body, and need not, therefore, hesitate to seek to trace to their unequal use the difference of refraction in a pair of eyes.

The forms of anisometropia are exceedingly varied, both in kind and degree.

An emmetropic eye may have its fellow possessed of myopia, hyperopia, or simple or compound astigmatism, either hyperopic or myopic, or mixed astigmatism, or a myopic eye may be unequally yoked with a more myopic one, or with an hyperopic one, or with one of the forms of astigmatism.

Or again, a hyperopic eye may find itself in the same dilemma, or, finally, we may find astigmatism in both eyes, but differing either in kind or degree, or both, or in the direction of the meridian of greatest refraction. As clear binocular vision depends upon the power to fuse the two images received on the two retinae, it will be seen that the disturbance of vision and the resulting discomfort may vary much according to the character and degree of ame-

tropia, and also—and this I would wish to emphasize—according to the individuality of the patient. We have all no doubt seen this individuality, this “personal equation,” appear as a marked factor in the results of our work. One will be harassed and worried by the slightest imperfection of vision, while another will profess to see perfectly, satisfied with acuity of vision which on testing proves to be far below normal.

In connection with the existence of anisometropia we will find one or the other of the following conditions:

1. Distinct binocular vision, with or without symptoms of asthenopia. We will naturally find this more frequently, although not invariably, where the eyes differ in the degree rather than in the kind of ametropia.

2. The eyes are never used together, usually the one being employed for near work and the other for distance. This is evidently to be expected where the anisometropia is of different kinds.

3. We may have an entire disuse of the one eye, all work being performed with the other. This is usually dependent upon a marked defect or deficiency of power in the unused one, leading to an increase of this latter condition.

The interest attaching to the question as to the relative frequency of anisometropia led me to tabulate the records of my last 1600 cases examined on account of symptoms pointing to the existence of ametropia. Of this number I found that 91 per cent. were actually suffering from symptoms capable of being removed by correction of errors of refraction, while the 9 per cent. were put on other treatment.

Of these ametropes 48 per cent. had hypertropia, 9 per cent. myopia, and 10 per cent. astigmatism (including hyperopic, myopic, and mixed), and 33 per cent. (*i. e.*, 482 cases) anisometropia of the various kinds. These 482 cases I found distributed as follows:

Differents degrees of hyperopia, 101 cases, or about 21 per cent.; different degrees of myopia, 22 cases, or a little over 4 per cent.; emmetropia with either hyperopia, my-

opia, or astigmatism, 21 cases, about 4 per cent.; hyperopia in one and myopia in the other, 8 cases, or not quite 2 per cent.; hyperopia in one, with astigmatism in the other, 93 cases, about 20 per cent.; myopia combined with astigmatism 23 cases, or a little over 4 per cent.; hyperopic astigmatism in each, differing in degree or in the direction of the meridian of greatest refraction, 159, about 33 per cent.; myopic astigmatism in each of different degrees or axes, 55 cases, nearly 12 per cent. It will be seen that nearly 50 per cent. of all simple cases of so-called ametropia are hyperopic, and that in anisometropia we have the same preponderance of the hyperopic element. It will also be noticed as an interesting fact that the astigmatic cases of anisometropia, both hyperopic and myopic, are more numerous than the corresponding simple hyperopic and myopic forms, 33 per cent. and 12 per cent. as compared with 21 per cent. and 4 per cent. respectively. Of 103 cases when there was astigmatism in both eyes, 77 per cent. differed in degree, and 23 per cent. in the direction of the meridian of greatest refraction. As to this direction we found more than 66 per cent. either at 90° or 180° .

Of those cases where only eye was astigmatic, 73 per cent. had their axes at 90° or 180° , whereas in cases of ordinary astigmatism (not anisometropic) 87 per cent. had their axes at 90° or 180° . Dr. H. Knapp lately presented to the American Ophthalmological Society a paper on "The Law of Symmetry of our Eyes as Manifested in the Direction of Their Meridians; its Rules and its Exceptions." It was based on 1000 successive cases of astigmatism for which he had prescribed glasses with more or less satisfactory results.

He found the meridian of strongest refraction (the shortest radius of curvature) placed symmetrically, either as vertical, horizontal, or diagonal in both eyes in 84 per cent.

Finally, as to treatment with glasses:

In every case the presence of a "personal equation" forbids the laying down of any absolute rules; the only principle that I would insist upon is that we must endeavor

to give satisfaction to each individual patient without regard to any theoretical considerations. This may seem an almost puerile injunction to some, but not to those who have met with unfortunates worrying along for months with glasses to which they were faithfully striving to become accustomed. This principle will often require apparently opposite modes of procedure, but as a general thing a second precept, which has of course its exceptions, may be laid down, viz., avoid compromises. Here, as in so many other instances, compromise rarely gives satisfaction to either party. It should *never* suggest itself in prescribing *near* glasses for hyperopes, nor distance glasses for myopes. In both these cases it is very rare indeed to find objections to perfect correction of each eye, especially where the acuity of vision is the same in both, and where the difference between the eyes is in the degree and not in the kind of ametropia.

Where there is a difference in the acuity of vision, manifestly the natural and most correct way is to give the best possible vision to the better eye, and not to sacrifice any of its advantages to the supposed requirements of the other eye.

Cases of astigmatism I have found singularly amenable to separate treatment, even where the differences have been very great, both in degree and in the direction of the meridian of greatest refraction, and even where the difference has been one of kind I have often been able satisfactorily to combine exceedingly dissimilar glasses. The following prescriptions will illustrate :

Differences in degree :

$$\begin{array}{rcl}
 \text{R.} - \frac{1}{4}\frac{1}{2} \text{ cy. ax. } 90^\circ & \left\{ & - .90 \text{ D. cy. ax. } 90^\circ. \\
 \text{L.} - \frac{1}{1}\frac{1}{4}\frac{1}{4} \text{ cy. ax. } 90^\circ & \left\{ & - .25 \text{ D. cy. ax. } 90^\circ. \\
 & \text{or} & \\
 \text{R.} - \frac{1}{4}\frac{1}{2} \text{ cy. ax. } 180^\circ \text{ } \sqcap + \frac{1}{4}\frac{1}{8} \text{ cy.} & \left\{ & - .90 \text{ D. cy. ax. } 180^\circ. \\
 & & \text{ } \sqcap + .75 \text{ D. cy.} \\
 \text{L.} - \frac{1}{6}\frac{1}{0} \text{ cy. ax. } 180^\circ \text{ } \sqcap + \frac{1}{1}\frac{1}{4}\frac{1}{4} \text{ cy.} & \left\{ & - .65 \text{ D. cy. ax. } 180^\circ. \\
 & & \text{ } \sqcap + .25 \text{ D. cy.}
 \end{array}$$

Difference in direction of axes :

For reading :

$$\begin{array}{l} \text{R.} + \frac{1}{12} \text{C} + \frac{1}{30} \text{cy. ax. } 180^\circ \\ \text{L.} + \frac{1}{12} \text{C} + \frac{1}{60} \text{cy. ax. } 110^\circ \end{array} \left\{ \begin{array}{l} + 3 \text{ D. } \text{C} + 1.25 \text{ D. cy. ax. } \\ \quad 180^\circ. \\ + 3 \text{ D. } \text{C} + .65 \text{ D. cy. ax. } \\ \quad 180^\circ. \end{array} \right.$$

or

$$\begin{array}{l} \text{R.} + \frac{1}{30} \text{C} + \frac{1}{12} \text{cy. ax. } 106^\circ \\ \text{L.} + \frac{1}{30} \text{C} + \frac{1}{12} \text{cy. ax. } 180^\circ \end{array} \left\{ \begin{array}{l} + 1.25 \text{ D. } \text{C} + 3 \text{ D. ax. } 160^\circ. \\ + 1.25 \text{ D. } \text{C} + 3 \text{ D. ax. } 180^\circ. \end{array} \right.$$

Differences in kind :

$$\begin{array}{l} - \frac{1}{60} \text{cy. ax. } 180^\circ \quad \Gamma + \frac{1}{144} \text{cy.} \\ - \frac{1}{48} \text{cy. ax. } 180^\circ \end{array} \left\{ \begin{array}{l} - .65 \text{ D. cy. ax. } 180^\circ. \\ \quad \Gamma + .25 \text{ cy.} \\ - .75 \text{ D. cy. ax. } 180^\circ. \end{array} \right.$$

or

$$\begin{array}{l} \text{R.} + \frac{1}{48} \text{cy. ax. } 90^\circ \\ \text{L.} + \frac{1}{72} \text{C} + \frac{1}{144} \text{cy. ax. } 90^\circ \end{array} \left\{ \begin{array}{l} + .75 \text{ D. cy. ax. } 90^\circ. \\ + .50 \text{ D. } \text{C} + .25 \text{ D. cy. ax. } \\ \quad 90^\circ. \end{array} \right.$$

or

$$\begin{array}{l} \text{R.} + \frac{1}{48} \text{cy. ax. } 90^\circ \\ \text{L.} - \frac{1}{30} \text{cy. ax. } 180^\circ \end{array} \left\{ \begin{array}{l} + .75 \text{ D. cy. ax. } 90^\circ. \\ - 1.25 \text{ D. cy. ax. } 180^\circ. \end{array} \right.$$

or

$$\begin{array}{l} \text{R.} - \frac{1}{16} \text{C} - \frac{1}{60} \text{cy. ax. } 180^\circ \\ \text{L.} + \frac{1}{48} \text{cy. ax. } 90^\circ \end{array} \left\{ \begin{array}{l} - 2.25 \text{ D. } \text{C} - .65 \text{ D. cy. ax. } \\ \quad 180^\circ. \\ + .75 \text{ D. cy. ax. } 90^\circ. \end{array} \right.$$

In the paper above alluded to Dr. Knapp recommends that we should try to approach symmetry in the prescriptions for unsymmetrical cases as near as is compatible with a good correction of the visual acuteness. (By symmetry he means the symmetrical deviation of the axes of the cylinders to the nasal or temporal side of the vertical meridian ; thus 80° and 100° would be symmetrical, because both represent 100° deflection to the nasal side.)

I have found it more satisfactory in the majority of cases to retain the exact deviation of the meridians found during the paralysis of the accommodation than to attempt to ob-

tain perfect symmetry. Hence in the following I retained as the only ones giving satisfaction :

$$\begin{array}{l} \text{R. } + \frac{1}{24} \text{ cy. ax. } 15^\circ \\ \text{L. } + \frac{1}{30} \text{ cy. ax. } 150^\circ \end{array} \quad \left\{ \begin{array}{l} + 1.50 \text{ D. cy. ax. } 15^\circ. \\ + 1.25 \text{ D; cy. ax. } 150^\circ. \end{array} \right.$$

for reading, and

$$\begin{array}{l} \text{R. } + \frac{1}{36} \text{ cy. ax. } 15^\circ \quad \text{┐} - \frac{1}{30} \text{ cy.} \\ \text{L. } + \frac{1}{42} \text{ cy. ax. } 150^\circ \quad \text{┐} - \frac{1}{36} \text{ cy.} \end{array} \quad \left\{ \begin{array}{l} + 1 \text{ D. cy. ax. } 15^\circ \\ \quad \text{┐} - 1.25 \text{ D. cy.} \\ + .90 \text{ D. cy. ax. } 150^\circ. \\ \quad \text{┐} - 1. \text{ D. cy.} \end{array} \right.$$

for distance, whereas, the axes should have been either 30° and 150° , or 15° and 165° , in order to obtain symmetry. Also in one of the other prescriptions given above the axes 160° in one and 180° in the other gave greater satisfaction than either 160° or 180° in both.

Finally, in changing the glasses after months or years the same principle of treating the individual and his *individual* eyes should guide us. The eyes may not have aged alike, and the change made in the one will often have to be greater than that required in the other.

In every case, therefore, even in prescribing glasses for anisometropia, one rule should be absolute and invariable, viz., individualize.

DYSPEPSIA AS AN UNDERLYING CAUSE OF NASO-PHARYNGEAL CATARRH.

BY WM. DULANY THOMAS, M. D., BALTIMORE, MD.

While at one time in the history of medicine disease was treated as alone dependent upon organic or functional derangement existing in the organ itself without reference to remote causes, we now recognize how impressions brought to bear reflexly upon some other organ or tissue may produce well marked alterations of function. In order that these impressions may be appreciated and that we may have a true reflex action physiologists, at the present day recognize as necessary : “(1) a sensitive nerve fiber connected with (2) a central nervous cell or mechanism, which in its turn is connected with (3) a motor fiber, supplying some other organ.” The term reflex as defined by Flint is not confined to the action of the spinal cord, but applies also to any generation of nerve force produced by stimulation of a nerve center. Thus respiration is subject to reflex action produced by impressions received through the medulla oblongata by afferent fibers, as when a dash of cold water is thrown in the face. The centers for cardio-inhibitory action, capillary dilatation or contraction (vasomotor), the act of swallowing, etc., and certain centers for complex bodily movements, although presided over by distinct nerves having their origin centrally located, are also affected by extraneous causes. “An animal with its medulla oblongata can execute much more complicated reflex acts than one with its spinal cord alone.” So great is the number of important reflex and automatic centers

located in the medulla that it has been called the "nerve central organ of the nutritive processes."

We then may consider reflex action as not confined to the cord, but produced by any impression received by a sensitive nerve fiber upon a central nerve cell or mechanism, which is in turn connected with a motor fiber supplying some motor organ. Probably there is no other organ in which this tendency is so well defined as in the nose and through it, directly or indirectly, the pharynx and buccal cavity. Boswell has reported two cases of salivation as a result of intra-nasal disease existing in elderly people in whom the flow of saliva, though small, gave rise to an almost uninterrupted expectoration. Hack goes still further and cites a long list of reflex troubles, among which may be mentioned cardiac palpitation, tumefaction, and redness, either temporary or permanent, of the skin of the nose, cephalalgia, migraine, ciliary neuralgia, gastralgia, dyspepsias, etc., etc. Although Hack does not give the opposite condition of affairs and place dyspepsia as the cause rather than the effect of naso-pharyngeal disease, I feel quite confident that he recognizes such to be the case. That dyspepsia is the direct or indirect exciting cause of naso-pharyngeal catarrh in a large percentage of cases there remains but little doubt in my mind. Were it necessary I could cite many cases coming under my care in which symptoms referable to the stomach were a marked feature in the clinical history of the patient and in which little good could be accomplished until treatment was directed to this organ. In such cases no amount of local treatment will effect a permanent cure until the stomach, the liver, and the bowels are restored to their normal action. Indeed, I may go still further and include the heart, the lungs, the kidneys, and, in fact, a general rejuvenation of the whole system.

In children acute attacks of dyspepsia are almost sure to be manifested by symptoms of pharyngeal inflammation and produce a parched condition of the mucous membrane of the pharynx with pain on deglutition, extending to that

of the buccal cavity. Added to this there may be deposits on one or both tonsils over the mouths of the follicles resembling strongly those present in tonsilitis. Extending up as high as the unaided eye can see and down to below the base of the tongue there is a coating of slimy, dirty mucus which may be expectorated by hawking. Sometimes dropping below a point where the pharyngeal muscles fail to act it passes thence by the peristaltic action of the esophagus to the stomach, there to increase the disturbance already set up. Consequent upon these symptoms a cough is excited, which, added to the picture above set forth, makes a diagnosis of acute pharyngitis the result of a cold a very plausible one. By the "regular" practitioner of medicine this mistake is far more apt to occur than with us who treat mainly upon symptoms and are accused of never making a diagnosis. Such a case falling under the care of the regular is treated with quinine, iron, etc., and as an adjuvant some pleasant syrup which only serves to increase rather than lessen the already disturbed condition of the stomach. With those skilled in the proper application of the law of similars and with whom a diagnosis is necessary, but not absolutely so, this misapplication of remedies is not known. The symptomatology of our drugs, together with their sphere of action, debars us from prescribing a remedy to increase irritation or inflammation when we wish to alleviate such.

Referring back to dyspepsia as a cause for pharyngeal disease let us examine into the ætiology whether the derangement be acute or chronic. The food upon which some children are allowed to subsist is, to say the least, most injurious. It has not been many days past since in walking along one of our streets I overheard a small child say to one even smaller, "If you don't give me a big piece of that pickle mamma will beat you," and to put more force to her intimidation announced the news to her mother. While I merely mention in this connection pickles as an exciting cause of gastric catarrh, especially in children, I include under the same class condiments of all kinds: coffee, tea,

fried articles of food, pastry, sweetmeats, etc., etc. That one child may pass this epoch of its life without the manifestation of any serious trouble is no plea for the continuance of such luxuries. Supposing it to have grown from childhood to adult age it has nine times in ten laid the foundation for dyspeptic and other troubles. I have under my care at present a child about ten years of age who, I am quite sure, has during the most of her life been allowed to partake of almost any luxury in diet that she might desire, and especially pickles, who has until lately suffered much from hypertrophied tonsils. My advice to her mother was to discontinue the use of all superfluous food and to restrict her to a plain but substantial diet. This with the addition of a properly selected remedy has served to restore her to good health, and, what is more, has reduced the size of the tonsils. An examination of the nose and the throat of a child who has been allowed to select its own bill of fare and who suffers from catarrh will disclose in the nasal cavity the following conditions: the mucous membrane covering the turbinated bones swollen and almost entirely closing the space between the septum and the lateral walls of the cavity; from the postnasal space a quantity of mucus, more or less in amount, constantly dropping into the pharynx, where it is either hawked up or, passing below the point of voluntary action, is swallowed, thus helping to increase the symptoms of dyspepsia already existing. Other symptoms will be a tongue thickly coated with a yellow or white fur; small but capricious appetite; bowels constipated or loose, and an habitual foul breath; a listless and peevish disposition, with a desire to do those things he ought not to do, and to leave undone those things he ought to do. At night the child is extremely restless, and tosses from one side of the bed to the other, giving the impression that he is suffering from the effect of worms and thereby causing the practitioner, thinking that he must agree with the mother sometimes, to give a diagnosis of intestinal parasites. Let him, however, before doing so request that the child be

placed upon a restricted diet with a diminution in the allowance of sugar. Let him also request that to the milk the child drinks before being put to bed a small quantity of limewater be added, and that a piece of dry bread be given him to eat either separately or broken up in the milk. This latter procedure acts, I believe, mechanically by interposing its particles between the lumps of casein, thereby preventing the formation of firm coagula, and allowing the gastric juices to perform their duty in a more satisfactory manner.

What has been said in regard to the relationship between gastric disturbances and postnasal disease in children will in the main apply to adults. As a fitting example may be taken the man who, with a ravenous appetite, eats as much as he desires and takes but little exercise, and who once every third or fourth week has a reckoning day with his liver, after which some alleviation from the annoying symptoms follows. The nasal cavity and the pharynx of such a patient, providing he has symptoms of nasal catarrh, will present a similar appearance to that already described. The turbinated bodies of both sides will appear swollen and will encroach more or less upon the breathing space. In the pharynx will be noticed engorgement of the mucous membrane with elongation of the soft palate. The mucous membrane, normally well lubricated by its proper secretion, is dry and glistening, and all attempts at local treatment fail until attention is directed to the stomach and portal circulation together with outdoor exercise and hygienic precautions.

Another class of patients consists of those whose catarrhal symptoms depend upon causes underlying those of dyspepsia. Under this head Robinson includes women who are pale, careworn victims of nervousness and who suffer from palpitations, leucorrhœa, and mental derangements. In such may often be discovered atrophic conditions of the nose. "I am inclined to believe," says Robinson, "that just as the glandular apparatus seems insufficient in the stomach to furnish a healthy and adequate amount of digestive fluid,

so the pale, contracted, improperly nourished pituitary membrane, which is only an accompaniment of gland atrophy, explains in some degree the presence of those hard, scaly, adherent, bad-smelling deposits which, under these circumstances, we are apt to notice in the nasal passages, upon the septum or turbinated bodies, or lodged higher up in the naso-pharynx." To these remarks of Robinson's I can but assent.

In what way does dyspepsia thus act to produce these reflected symptoms of pharyngeal disease? We well know from personal experience how a hearty meal consisting in part of indigestible substances provokes a desire for fluids for some hours afterward, and manifests itself by a dry, parched sensation in the throat, which disappears after the food passes out of the stomach. Again, those suffering from indiscretion in diet, the effects of which have gone so far and lasted so long as to produce disordered digestion, complain greatly of bad taste in the mouth, with a coated tongue and a desire to expel some foreign body from the throat, together with the expectoration of mucus more or less viscid in character. If dyspepsia can thus operate to cause such symptoms, why can it not go a step further and produce naso-pharyngeal catarrh?

I grant that all cases of dyspepsia are not accompanied by this local disease; but the explanation is a satisfactory one, and as it explains in some instances the conditions already stated I therefore give it. The normal condition of the glandular apparatus of the stomach provides for the secretion of certain digestive fluids. These digestive fluids acting normally convert such articles of food capable of digestion by them into dialyzable bodies known as peptones. Should this conversion not occur and fermentation instead of digestion take place, certain irritant gases will be formed according to the nature of the food ingested. Thus albuminous substances will generate sulphureted hydrogen, and the gas expelled cannot be mistaken for any other, provided one has ever smelled it; the butyric decomposition gives off hydrogen and carbon dioxide, and the

latter is also furnished by the acetic acid fermentation. Lactic acid, it appears, is unattended by the formation of gas. Consequent upon the generation of the various gases distinct symptoms referable to the stomach may be experienced, such as painful distention, causing embarrassed respiration from pressure upon the diaphragm, together with its accompanying symptom, palpitation. These gases, which in this class of dyspeptics are continually forming, are particularly irritant to sensitive mucous membranes, and arising from the stomach must necessarily come into immediate contact with the mucous membrane of the nasopharynx and produce the ordinary symptoms of catarrh. If this reasoning be correct, and I believe that it is, is it difficult to understand how a long course of treatment directed locally produces comparatively so little benefit? Given a case of chronic dyspepsia with the symptoms above narrated, constitutional treatment of the underlying cause is required, and will in the majority of instances yield satisfactory results. In reference to the treatment alluded to I shall have but little to say, leaving it to the attending physician to determine in each case the remedy best suited to the totality of the symptoms.

Local applications to the hypertrophied tissues not only alleviate annoying symptoms, but also aid to a certain extent in the cure. In this connection I do not refer to corrosive agents, which have their particular sphere of usefulness, but more particularly to emollients. As worthy of remark may be mentioned the various preparations of benzoinol, Seiler's alkaline spray, and Marchand's peroxide of hydrogen in the proportion of one to four or six. For the hypertrophied tonsils I have used pure glycerin applied locally, and although my experience in this direction has not been extensive, I have reason to be favorably impressed with it, not only because of the relief that it gives the patient, but also from the power it possesses in lessening capillary engorgement. Eight or ten applications per diem are necessary, because of the constant flow of saliva over the parts. As this portion of the treatment

must be left to the patient, it is next to impossible, except in rare instances, to have this phase of the treatment faithfully carried out. In addition to the remedies given for dyspeptic symptoms may be remembered others which act more especially upon the tonsils, viz.: baryta carb., calc. carb., kali carb., calc. phos., and graphites. Finally, remember that dyspepsia may be an underlying cause, as has been tried to be shown by this article, and demands earnest attention.

THE TREATMENT OF INSUFFICIENCY OF THE INTERNAL RECTI MUSCLES BY SYSTEMA- TIC EXERCISE WITH PRISMS.

BY F. D. W. BATES, M. D., HAMILTON, ONT.

In the case of "Odontalgia Resulting from Insufficiency of the Internal Recti," mentioned in the April number of THE JOURNAL OF OPHTHALMOLOGY, etc., I would like to ask if the same or better results could not have been obtained by strengthening the internal recti muscles by the systematic use of prisms with the apex inward as by prescribing prismatic glasses with the base inward. I have never prescribed such glasses, being under the impression that they have a tendency to weaken the muscles that should be strengthened. On the other hand, I have had a great many very brilliant results from the systematic use of prisms with the apex inward. I will cite one or two cases from memory, as I have not my case book at hand.

Rev. T. B., æt. forty, consulted me first about two years ago, with compound hyperopic astigmatism and divergent strabismus. Had had cylindrical glasses fitted to his eyes by a prominent Toronto oculist some three or four years previous, who suggested at the time an operation; but he would not submit to the same. When he consulted me I told him, of course, that the quickest way to correct the trouble would be by operation, but if he would not submit to it I would see what could be done with prisms. I should have said that he could momentarily fix the eyes upon an object close by, but the left eye would immediately diverge. I found that the most he could overcome was a prism of about 5° and that only for an instant. There was slight

amblyopia of the left eye. I saw him daily for about two weeks, exercising the muscles myself, and giving him a prism of 5° to use several times a day. Within two weeks he could overcome a prism of about 15° , one of which degree I gave him to take home with him. This was used daily three or four times a day, and changed about once a month for a stronger one until he could overcome one of 75° . Within one year from the time I first saw him the strabismus had entirely disappeared, his eyes being perfectly straight. He still keeps the prism of 75° and uses it occasionally, but has very little trouble with his eyes, being able to read for any length of time without discomfort. The only remedy he took was *agaricus 6x*, which I gave him for a twitching of the lids, with which he had been troubled for some time, but which quickly disappeared under the drug.

It seems to me that if such a great degree of insufficiency of the internal recti as the above can be corrected by the systematic use of prisms, certainly the lesser degrees ought to be cured by the same treatment. Another case I have in my mind is that of

Miss E. W., æt. forty-eight, who consulted me first about one year ago. She had not for years been able to read or do any close work for five minutes at a time without experiencing severe pain in the eyes. Could not even play a game of cards in the evening without suffering for it both at the time and the next day. She had been under the care of some of the most prominent oculists in New York and Cleveland; but no one had ever given her any relief. I had known of the case for at least seven or eight years, having heard of it through several of my patients to whom she was well known, and of course was anxious to try the prismatic treatment on the case. I found a slight hyperopia—less than 1. D.—with the asthenopia. A peculiarity of the case was that upon first trial she could overcome a prism of 14° , but the muscles immediately tired and upon the second trial she could not even overcome one of 6° . So I commenced operations with a prism of 1° , exercising for about five minutes with that, and then going to 2° and 3° , and so on, giving her one of the weakest to take home with her each day. For the first week we did not make much progress, and she was beginning to be discouraged and would have discontinued treatment had I not been so positive

in my assertions that I would cure her if she would continue. After about one week she commenced to improve, and within six weeks could overcome a prism of 35° with ease, and could use her eyes with comfort for half an hour at a time, though I advised her not to try them too much for a while. There were no special indications for remedies, the principal ones she had being jaborandi and agaricus.

These are two of the most marked cases I have had; but I have scores of cases in my record books where the results have been equally as good.

The prescribing of prismatic glasses with the base inward may be good treatment, but I have never considered it such. However, I know that some of our best oculists do prescribe them, and I am open to conviction if anyone is disposed to take up the subject and explain the why and the wherefore.

APROPOS OF THE RARITY OF CORTICAL LARYNGEAL PARALYSES.*

BY DR. PAUL RAUGÉ, CHALLES, FRANCE.

In the topographical distribution which attributes to each voluntary function a determined point of the cerebral cortex, the apparatus of phonation has been one of those longest forgotten and the last perhaps to find its place ; yet that which we accord it to-day remains very uncertain and indifferently discussed.

Until late years—1876 (Ferrier), 1877 (Duret)—there seemed no doubt that we must seek in the upper regions of the encephalon for the initiation of any movement of the larynx ; yet it appeared quite natural and completely satisfactory to localize in the medulla, aside from the purely organic reflexes of which this organ is the usual center, the origin of the highest and the most evidently psychic among the animal functions, the act of phonation, the primary and necessary element of articulated speech, that a transformation more intellectually differentiates from the elementary laryngeal sound.

The cause of the misunderstanding probably resides in the incomplete analysis of the laryngeal attributions ; the fact that has been neglected, and which is capital, is that the larynx is an apparatus intended for a double purpose, accomplishing alternately two different functions, which are, up to a certain point, antagonistic : One associates the

* Société Française d'otologie, de laryngologie et de rhinologie, (*Bull. et Mém. de la Société*).

organ directly to the mechanical phenomena of the respiration; this is the active dilatation its abductor muscles exercise incessantly on the fissure of the glottis during silent respiration. The other makes the larynx the instrument *par excellence* of phonation. If the first, like all vegetative functions, comes undeniably from the medulla, the evidently conscious nature and the manifest volition of the second would become sufficient *a priori* to affirm its cortical origin. And it is precisely because it obeys turn by turn the orders of the brain or cedes to impulsions from the medulla that the larynx is capable of accommodating its motor apparatus alternately to one or the other of these two contradictory functions with which it is cumulatively charged. It is because they have not taken into consideration this important functional dissociation that all physiologists for fifteen years have confounded in the medulla all the forms of the activity of the larynx, as well as the movements which the infinite shades of the vocal modulation realize, with the simple *tonus of the abductors* by which the glottic gaping is continually assured in the vibrations of the respiratory current.

The idea of searching in the cerebral convolutions for a center for phonation belongs to Ferrier first, who only vaguely perceived it, but especially to Duret, who gave it, the following year, a less indefinite form, and commenced control experiments. Neither one of these, however, succeeded in establishing, in a positive manner, the new localization of which both saw the necessity. But they did not find the center for the larynx, for the good reason that this was not, properly speaking, what they sought.

What they have the appearance of following—to read the recital of their experiments—never was, in fact, the center of the origin of the activity of the larynx or of a circumscribed form, the form essentially vocal, of this motor activity; it was a vague focus of cerebral impulsion, commanding by itself alone only the functions of phonation; it is, to the letter, a vocal center autonomous and complete; not, I repeat, a purely laryngeal center, but a region of the cor-

tex all-powerful and only potent over the totality of the mechanical acts of which are composed the phenomena of phonation. To respond to the attempt of these first experimenters it seems that the excitation of this ideal center should be sufficient to realize all parts of the act of phonation, as its ablation has suppressed it. Both appear to have forgotten that the production of the glottic vibrations which constitute the voice demands not only the setting in activity of the larynx, but the collective intervention of at least two muscular acts; the contraction of the glottis, which without doubt, modulates and graduates the oscillations of the aërial current, but above all, the expiratory effort, conscious, voluntary, and rhythmic, which is itself the source of this current, therefore of all the phenomena. To these two acts, synergic but perfectly dissociable, should necessarily correspond, at the surface of the brain, two centers, associated functionally, but anatomically distinct. To realize experimentally, as Duret thought to obtain it, it is necessary then to carry the excitation not only to the motor focus of the larynx, but to put in action simultaneously each of the cortical centers which command the double mechanical element of the function; it was probably a diffuse effect of this kind which the plate of cork determined that Duret employed as a means of excitation of the cerebral surface. Pursuing the act of phonation as an indecomposable fact, and seeking for this complex fact a single cortical representation, the experiments of Duret could evidently only lead him to the discovery of the exact zone that his successors have since named the cortical laryngeal center. Thus it is not astonishing that the location indicated by him does not correspond to what we regard to-day as the true psychomotor center for the larynx.

The merit of Krause, that of Masini and of Simon and Horsley, was to separate from the whole act the part which properly belonged to the larynx, to study it alone; at the same time they introduced in their researches a rigorous and an absolutely exact experimental method. As undertaken by Duret, they carry over the surface of the brain

the experimental excitations ; but for the mechanical compression of the explored regions, a method *par excellence* inconstant, blind, and diffuse, they take care to substitute the circumscribed and measurable action of an induced current, of which the point of an electrode exactly limits the effect to the point mathematically chosen from the gray substance. More, and what was a great progress in this kind of work, in place of estimating the results of the experimental action according to the more or less abstract variations of an acoustic phenomenon, impossible to analyze, they question directly, either with the mirror or by immediate observation of the larynx, which has been partially exposed, the modifications of the glottic image in each phase of the experiment. Introduced very ingeniously by Krause in experimental technic, laryngoscopic exploration substitutes in a very fortunate way the visual demonstration of a simple and exact phenomenon for the treachery of alterations which are complex phonic acts and for which the disordered larynges are not always and solely responsible. From this moment the exact research for a cortical center for the vocal movements of the larynx, of the larynx exclusively, replaced the confused ideas of the phonator center, comprised in the too much extended sense that has been given it by the older observers.

Once placed in this direction, which is evidently correct, the researches of physiologists could no longer lack fruit. After having established the limits of the voluntary laryngomotor center in the lower animals (Krause), they have, a little later (Simon and Horsley), indicated the probable situation of this same center in man by extending the experiments to animals in which the cerebral topography approaches nearest, such as the ape (*macacus rhesus*, *macacus cynomolgus*, and especially *macacus cynicus*). Except experiment on man himself this was the most that physiology could do for the solution of this problem.

What is very strange and very peculiar in this still new chapter of cerebral localization is that the little we know of this difficult question belongs almost entirely to experimen-

tation on animals. Human pathology has furnished nothing to support it. This singular abstention of the clinic on this point is so much the more surprising because the researches on other motor points have been supported by pathology at once. When Broca discovered his center for verbal articulation observations abounded almost immediately ; they soon became so numerous that facts of motor aphasia with circumscribed alteration of the foot of the third frontal are now too common for publication. With regard to the phonator center for the larynx it is quite different ; in spite of the fifteen years that we have sought for it observations on this point still count. They count so much that, in the very considerable number of cases published in this relation, we can, after a critical analysis, preserve only three which may be of slight service for the control of the affirmations of pure physiology.

This default of the clinic, or this indifference in the face of a question of such importance, does not prove, as has been pretended, that laryngeal paralysis of cortical origin is a pathological fiction corresponding to an exceptional cerebral lesion, or even, as has been stated, to one that cannot be real. If there exists, as we are positive at present, a point of the cerebral cortex exclusively intended for the direction of the vocal movements of the glottis ; if, as all are brought to believe, there exists such a center in each hemisphere ; if, as affirmed by Simon and Horsley, this point occupies in the foot of the ascending frontal an extent at least comparable to that of Broca's zone, with which it shares in the arterial supply (branch of the sylvian artery), and with which it seems continuous, this center must be as exposed as is the center for spoken language to vascular lesions of its tissue, and we cannot well perceive by what especial favor it can escape more than it, or more than any other motor point, from the varied alterations which indistinctly attack all departments of the gray substance. Logically, laryngeal paralyses of cerebral origin should be as frequent as the common hemiplegias ; they should be twice as frequent as motor aphasia, since there exist two laryngeal

centers, a double risk. And how the hemiplegias of the limbs and motor aphasias encumber the hospitals while cortical laryngeal paralyses remain a rare fruit of the clinic, that laryngology disputes with nerve pathology! This is an interesting paradox, the causes of which it appears interesting to seek.

The interpretation presents of itself, if we accept the ideas that Simon and Horsley profess on the working of the laryngeal center. This center, as we know, is not, according to some authors, represented by a single zone, unilateral and symmetrically placed in only one of the hemispheres, as happens, for example, for the foci of language, which are all, motor or sensory, disseminated at the surface of the left hemisphere. The vocal movements of the glottis are, on the contrary, represented in two identical regions occupying symmetrically, in each half of the brain, the most anterior part of the foot of the ascending frontal. So far there is nothing to discuss; clinicians and physiologists are nearly in accord on the topographical position of the laryngeal center; except for very rare differences of opinion (Seguin), they are also in agreement on its bilaterality.

But here is the original point and also the most contestable part of Simon's doctrine; each one of these two laryngeal centers does not limit its action to the opposite side of the glottis, in the same way as other symmetrical psycho-motor points; it extends its power to both vocal cords so well that each of these two motor regions represents in sum only a functional repetition and is, so to speak, only the double of the other. From this it results that the phonator act is assured on both sides against pathological risks much better than is the motility of the limbs or the conservation of language. Suppress, in a single hemisphere, the focus or the conductors of voluntary motility and there results a simple hemiplegia; destroy Broca's center, you annul at once the function that it possesses and produce by this alone a motor aphasia. Imagine now a lesion, likewise unilateral, attacking one of the laryngeal centers: this alteration, though entirely destructive, would remain, in a clinical

point of view, absolutely inexpressive, and the movements of the glottis would continue as if nothing had occurred; that is, being unilateral, the supposed lesion remains without effect on the activity of the larynx. It cannot paralyze all the organ, since one of the centers persists, nor even paralyze the motility, since the center which survives survives with all its bilaterality of action. This is why, for Simon and Horsley, the laryngeal center represents an unattackable focus, in a pathological point of view, and why its alterations remain clinically mute, constantly escaping our notice.

It is also necessary to guard against seeing in this somewhat paradoxical affirmation a simple view of the mind. On the contrary, its partisans build on exact experiments. At once realizing artificially the hypothesis, they show that the movements of the glottis persist, and persist on both sides, after the total destruction of one of the laryngeal centers, even after the ablation of all of one hemisphere.

However, clinical experience appears here in complete discord with the results of vivisection. If the preceding conception were true, cerebral paralyses of the larynx would be only an exception; they would be a pathological impossibility, except in the rare coincidence of two symmetrical lesions attacking at once both hemispheres. Now, we know to-day a small number of well observed facts (Garel, Dejerine) which are worthy of credence, in which the hemiplegia of the larynx undoubtedly recognizes as a cause a limited alteration of the cortex. In spite of the gaps that we find these observations are convincing, and in this relation I cannot partake of the somewhat tenacious skepticism of Simon and Horsley. In any case they suffice, in spite of their extreme rarity, to add materially to the proof of the fact that the unilateral alterations of the laryngeal center do not remain latent, but express themselves clinically by a hemiplegia acting on the opposed half of the glottis.

In spite of its seductions the doctrine of Simon does not seem, then, to be the true explanation of the penury of the

clinical facts that I now deplore. This absence of recognized documents belongs, in my estimation, to a higher reason, but one which is infinitely more practical, and one that I believe to be more exact. It has simply for a cause the peculiarly obscure conditions in which the phenomena present and the difficulty that the observation of the patients offers in these circumstances.

If cortical laryngeal hemiplegias are so exceptionally noted it is not because they are physiologically impossible or less possible than others. It is because we do not know how to recognize them; and that they escape observation ninety-nine times out of a hundred during the ordinary clinical research. It is exactly these particular difficulties of which I propose, in what follows, to analyze the nature and the causes; perhaps also I shall contribute to show in what manner these cases should be sought and to render them more numerous in the future.

The first fact to note is that cortical paralyses of the larynx are only revealed by the vocal disturbances, never by the respiratory symptoms. The undoubtedly active part (*tonus* of the dilators) that the opening of the glottis assumes in the mechanical phenomena of the respiration represents, we have seen, an eminently bulbar act, perfectly independent of the cortical center. Thus one should never wait to recognize, in this form of laryngeal paralysis, the marked dyspnœic phenomena which characterize, for example, the compression of the recurrent (aneurism of the aorta, tumors of the esophagus, etc.) or the alterations of bulbar nuclei (laryngeal crises of tabes).

But the vocal troubles themselves, which occur alone in the alteration of the cortex, may here pass unnoted much more easily than in paralyses of other cause, and for several reasons:

The first, and not the least considerable, is the constant unilaterality of this vocal paralysis. There occurs in this case that which always follows in motor troubles of hemiplegic form, whatever may be the nature or the cause; the default of adduction of the diseased cord is soon compen-

sated for by the increase of action which is imposed on the healthy cord, so well that, the glottic occlusion being nearly perfect, it is not true aphonia which appears, but a simple dysphonia determined especially by the default in the tension of the paralyzed cord. We have not, then, to register a gross fact, total suppression of the voice or of speech, but to grasp a shade, and a shade that easily escapes—if not with regard to its existence, at least in its interpretation—the most attentive ear.

It escapes the more easily as the vocal trouble never occurs here in an isolated and a simple state. In almost all the published cases the laryngeal alteration coincided with symptoms of aphasia, which we may comprehend without difficulty if we remember that the laryngeal center exactly limits, in front, the motor images of articulation. It is superfluous to insist on the difficulty that this symptomatic complication brings to the appreciation of the vocal trouble, and how hard it is to appreciate the state of the voice in a patient who does not speak and where we must separate the disturbance of intonation from the more prominent trouble of the verbal articulation.

This analysis would be certainly impossible and the laryngeal disorder would remain most often ignored, lost, so to speak, in the midst of the aphasic troubles if we had, to reveal its existence, a no more exact index than the alterations of the vocal modulation. The positive sign, if we remember to seek it, is the mechanical disorder occurring in the movements or in the attitude of the cords; it is the deformation of the glottic image which graphically expresses this motor perturbation; executed with a little address and interpreted as it should be, the laryngoscopic examination affords in such a case neither error nor equivocation, and puts positively under the eyes the motor disorder of which the ear only very confusedly perceives the acoustic consequences; it is almost always, in these circumstances, the laryngoscope which discovers the paralysis, and which often discovers it in cases where there is no exterior sign; it is this which recognizes the nature of the trouble by exactly

revealing the seat and the form, and sometimes shows one of the cords immobile when all the other symptoms would indicate a paralysis of the opposite cord (Garel's case).

But nothing is more easy than these diagnoses; it is sufficient, says one, to examine these patients. The trouble is that one does not examine them—I mean by this that one does not examine the larynx—at least they fall into the laryngologist's hands very rarely; as the state of their vocal cords is the least of their troubles, as this state is not indicated by any apparent symptom or is only announced by phonic symptoms lost in the midst of more grave accidents, patients of this variety are almost always met in the clinic of the physician where the laryngoscope is more or less disdained. We have also seen that these patients are also quite frequently aphasic, hemiplegic, comprehend little, responding badly or not at all, difficult of examination, reuniting at once all the conditions requisite to make the laryngoscopic examination difficult and disagreeable. Thus one too often avoids this effort, even when there are manifest vocal troubles; sometimes when even an aphonia more or less complete (cases of Ange Duval, of Luys, of Livio-Ronci, of Seguin) seems to solicit an examination.

Let us suppose, now, that this examination has been made, that a competent observer has found a loss of power in one cord, that the coincidence of other cerebral accidents, the absence of peripheral lesions or of bulbar phenomena gives rise to the idea of a cortical lesion. Shall we, on this simple suspicion, affirm that this lesion exists and cut short this great question of pathogeny by these clinical probabilities? Evidently not, and the facts advanced on these sole proofs (Lewin, first communication of Bryson-Delavan, Cartaz, the first two cases of Garel) cannot be counted as decisive. For an observation of this kind to constitute a complete document, a perfect autopsy must bring to the support of the clinical diagnosis its control material and its supreme consecration.

But here again we meet new difficulties, and autopsies of this variety are not like ordinary autopsies. In fact it is

not sufficient to find a cortical lesion ; it should be exactly limited to the presumed seat of the laryngeal center, so that we can closely affirm that this cortical lesion is the cause and the laryngeal hemiplegia is the effect. It must also be proven that the motor disturbance does not come from another source, that there exists no alteration in the cortico-bulbar fibers (sub-cortical layer, internal capsule, peduncular, or protuberential), in the gray nuclei of the medulla, in the roots of the spinal or the vagus, in the nerve trunks, in their terminal branches, in the laryngeal muscles themselves, or in the ary-cricoidian articulations. Thus it is seen what anatomical labor is demanded to render complete this kind of negative control.

It needs not only the macroscopic examination of sections taken from all the central and peripheral nervous apparatus of the larynx, but necessitates also a microscopical study of all the suspected regions in such a manner as to eliminate or to demonstrate the existence of foci of histological degeneration absolutely inappreciable with the naked eye. To comprehend the care that an autopsy of this nature demands, it is sufficient to read over in the original text the rare observations that we can cite as models of this variety, those of Bryson-Delavan, of Eisenlohr, of Garel, of Dejerine. We remember that in the celebrated case of the first author the autopsy found in a bulbar focus an unexpected explanation of a laryngeal paralysis that was published, during the life of the patient, as a case of cortical lesion ; that in the cases of Eisenlohr and of Garel the alteration was found in the internal capsule ; that, finally, in both facts furnished by Dejerine the lesion belonged to the class of those that Lichtheim and Wernicke have made known under the name of sub-cortical foci.

According to what precedes, the research for a cortical laryngoplegia bears two difficulties of different order : one is to find it, the other is to prove it. The first of these difficulties has to do with clinical intelligence ; the second deals with pathological anatomy.

Now to find a lesion of this variety it is necessary to seek it methodically and without waiting for the vocal trouble to reveal its existence exteriorly. For this we should take the laryngoscope in hand each time that a cortical alteration, demonstrated or rendered probable by other more clear symptoms, would make us suspect its presence. The day when, in the service of general medicine, we examine in this point of view all hemiplegics, all aphasics, all those affected by cerebral troubles of any nature, the day when the laryngeal mirror will be, in every case of this kind, applied in a methodical manner, even though no laryngeal manifestation seems to demand its employment, we shall begin to gather facts that will place us on a solid clinical basis.

To direct us in this research it is important to know in advance what would be, in such a case, the probable aspect of the glottis, what deformation and what motor trouble it is necessary to expect. And first, is the glottic image constant, is it characteristic in the variety? Can one, after the simple view of an immobilized vocal cord in such or such attitude, of a glottic opening, deformed or deviated in a certain manner, affirm the cortical seat of the original lesion? Affirm it, no, but suspect it, certainly. For my part I do not hesitate to declare that cortical paralysis furnishes an absolutely personal laryngoscopic image, one which well analyzed may lead at least to a diagnosis of great probability.

The characters of this abnormal image, the direction in which the glottis loses its mobility, are deduced very simply from some considerations of physiology into which we entered in the commencement.

Lesions of the cerebral cortex leave untouched the unconscious and continuous effort of the dilatation which responds to the respiratory side of the laryngeal activity (bulbar tonicity of the abductors); we observe no deformation as long as we examine the larynx in a state of repose. All the functional disorder acts on the adductor powers, exclusively intended, as we know, for phonation.

Thus when we ask the subject to produce a sound, the healthy cord alone is put in motion; the diseased cord remains passively in its situation of respiratory separation. It cannot even approach to the cadaveric position, since it has preserved no adductor energy capable of opposing the *tonus* of the adductors. There is, in fact, an absolute immobility of the cord, as much in the vocal phase as in the respiratory phase, but this immobilization in respiratory abduction resembles in no way, as to pathogeny or as to appearance, the immobilization in the cadaveric position which characterizes total glottic paralysis.

It is wrongly, then, that in almost all—I believe I might say all—the observations of this kind we constantly speak of cadaveric position. It is certainly an error of physiological interpretation as well as an error of laryngoscopic appreciation that it is useless to note. Dejerine himself falls here, and in a most astonishing way; after having indicated in both his patients this cadaveric attitude, he adds, further, the absolutely contradictory proposition that the respiratory activity was wholly preserved, as if the expression “cadaveric position” would not say rigorously, and without possible discussion, absolute inertia of the glottis, as much in the respiratory sense as in the vocal.

It is difficult to explain how the authors of which I speak have thus confused two positions as visibly different as are the cadaveric attitude and the respiratory abduction, one corresponding to a very small opening (five millimeters, Simon) of the glottis, the other to its greatest gaping (13.5 mm). But the cause of this error is certainly contained in the following fact: The vocal cord that remains healthy, exaggerating its normal excursion to go toward its immobile fellow cord, dissimulates in part the excess of the separation of the latter. It realizes this compensation, however, only at the expense of a certain glottic obliquity, which may easily escape from notice, but the demonstration of which will always suffice to correct the illusion of which I have spoken. This error may also be avoided if we take care to be sure that, during silent

respiration, both cords remain perfectly symmetrical. Evidently it would not be thus if the healthy cord were found in its normal respiratory position and the diseased cord in cadaveric position.

This permanent fixation of one cord in respiratory attitude being an absolutely particular laryngoscopic fact, it is then seen why I am correct in affirming that it is sufficient to characterize a cortical paralysis. In fact, it is not observed in the bulbar paralyses, where we find, on the contrary, a default of abduction, or in the recurrent lesions which produce according to the case either, when they are completely destructive, the true cadaveric position, or permanent abduction, when they are incomplete (Simon's paralysis of the adductors), or simply irritative (total contracture of Krause).

There exists, however, a single morbid state where we meet, as in the material lesions of the laryngeal center, the cords fixed in extreme abduction with absolute powerlessness in the sense of abduction; I speak of hysterical paralyses. It is not surprising if it is thought that these are also of cortical origin. But what will always distinguish organic paralyses is that, being functional disturbances *par excellence*, hysterical motor troubles are constantly bilateral, while lesions of the laryngeal center, save in the improbable cases where both sides are attacked, always remain rigorously hemiplegic.

This unilaterality of the cortical laryngoplegias is certainly not an absolute character or one that belongs to them alone; we sometimes find the hemiplegic form in lesions of the nerve trunks, although both recurrences or both pneumogastrics are usually included in the original lesion; we also meet it, although more rarely, in alterations of the medulla. All that I desire to note is that this character of asymmetry being only absolutely constant in the cerebral lesions, its pure and simple demonstration at once constitutes in a paralysis of doubtful origin a beginning of proof in favor of this origin.

Do not misinterpret this; I am far from affirming that

there exists a necessary correlation between the form of motor trouble and the anatomical cause which produces it, or that a simple examination of the larynx in a case of paralysis is sufficient to reveal the origin. No more than the external symptoms does the laryngoscope carry in this case a decision without appeal. If these symptoms appear as simple as possible, it renders all the more probable the ætiological diagnosis, but absolute certainty is only to be found on the *post-mortem* table. I have already insisted too long on the necessity of this proof ; it is only necessary to recall the extreme difficulty. It is this, much more than the ambiguity of the clinical phenomena, that makes this class of cases so difficult of observation and demands on this subject so severe a critical analysis.

Do we comprehend now why observations of this kind—I mean correct observations, appear in so small a quantity? Is it necessary, in order to explain it, to invoke the rareness of cases and to admit a law of exception for this form of cerebral localization? What is most lacking, I again repeat, is not the cases themselves, but observers sufficiently well armed to grasp them and to draw from them every possible point. Such would be clinicians fortunate enough to be initiated in laryngoscopic experience and in neuro-pathology, in the delicate researches of nerve histology and in the technic which is demanded to-day in the gross pathological anatomy of the encephalic organs ; this formidable array of attributes is indispensable to assure to the facts we meet the rigorous criticism which guarantees their authenticity.

SUBCONJUNCTIVAL INJECTIONS OF SUBLIMATE IN DISEASES OF THE CHOROID AND OF THE RETINA.*

BY DR. A. DARIER, PARIS, FRANCE.

Gentlemen, last year at this time I gave you a report on the excellent results obtained in ocular therapeutics by subconjunctival injections of corrosive sublimate. My claims appeared somewhat excessive, especially in relation to diseases of the fundus of the eye and of the choroid in particular.

I am justified, then, in returning to-day with new facts which not only confirm the previous results, but permit hope for the cure or rather the checking of certain affections often regarded as incurable. Perhaps even in the future local therapeutics by subconjunctival injections will be a means of ætiological diagnosis for some diseases of the fundus of the eye that are still very obscure.

To avoid all discussion on words I shall present to you, in the way of facts, only sketches taken by hand from nature, exact enough to reproduce before your eyes the lesions observed. Facing them will be placed the therapeutic results obtained both by general treatment and by local treatment with subconjunctival injections of sublimate. I especially desire to speak of facts; the explanations will be a sequence.

Rare are the cases in which we can speak of complete cure in diseases of the choroid or of the retina, for it is not often that we are called to treat these affections before they

* Société Française d'Ophthalmologie.

have had time to cause a destruction of the anatomical elements. An indelible cicatrix is the consequence ; but, on the other hand, there are many cases where the disease can be stopped soon enough to preserve the function without too much destruction. In no diseases of the fundus of the eye is it so important to act with rapidity and intensity as in those of the macula. To arrive at this end we know no better means than the subconjunctival injections of sublimate ; that we may regard as the first and the most active of speedy and intense treatments.

In most cases the effects are appreciable from the first or from the second injection ; at other times they are only seen after a great number of injections. But here are the facts :

In *central choroiditis*, when the central vision is not yet irremediably destroyed, we may obtain, if not always normal vision, at least a considerable amelioration of the visual acuity, and this in so short a time that it is impossible not to see here a relation of cause to effect.

Syphilis has been a cause only in a very small number of cases. Two cases could be attributed to hereditary syphilis. Three cases could be considered as of gouty nature, but we do not wish to insist here on the ætiology of the *macular choroiditis* ; only the treatment will occupy us to-day.

The results obtained in almost all the cases that we have observed of *central choroidites* have encouraged me to attempt the *subconjunctival injections of sublimate* also in the *macular alterations due to myopia*.

Experience has justified me in this. Last year I had already obtained two excellent results, but before communicating them to you I have preferred to wait a year longer.

The two cases, of which, unfortunately, I have not been able to take a sketch, were both of a very great gravity, both had lost one eye by *retinal detachment*, both presented choroidal alterations in long striæ, extending from the papilla toward the equator of the eye passing by the macula. It is these extensive choroidal alterations which

have caused me to think that even in myopia the subconjunctival injections would prove useful.

These two patients have derived great benefit from this treatment; both were condemned to absolute rest of their eyes, both have been able to resume their usual occupations for the past year, and their vision is markedly improved. From time to time, when these patients have *muscæ volitantes*, they return of their own accord to demand one or two *subconjunctival* injections.

I must confess to you also that I have not in any of the *myopic posterior sclero-choroidites* obtained as good results; but I do not believe that I am too much in advance in saying that in all cases where one could attack the myopic choroidal alteration in the beginning, as in Case VIII, where the central vision had been disturbed for only fifteen days, the vision may be improved to a great extent.

I present to you only three cases of myopic choroidal alteration, because it is scarcely three months since my chief has wished to care for these cases in this manner, persuaded that the myopic lesions were of mechanical origin.

What matters the origin? The mercurial treatment alone gives results; then local injections are still more indicated.

The same may be true of some retinal detachments consecutive to choroidal alterations. Unfortunately it has not been possible for me to experiment on cases of this kind.

In any case, it would be of great importance to be able to establish the fact that in treating the choroidal lesions of myopia we have good chances of preventing retinal detachment.

Now, up to the present time the treatment of myopic alterations has been very uncertain.

But let us return to facts.

What is the action of injections of sublimate in other diseases of the choroid and of the retina?

The quickest way will be to place before you the subjoined plates to allow you to judge for yourselves the results obtained in the different forms of *choroiditis*.

I only wish to insist on one point; this is, that the local

treatment has given better and more rapid results than the best applications of general treatment.

These cases are to-day not only numerous, but they are the majority of those where general treatment has been seconded or even advantageously replaced by the local treatment.

It should not be understood that I do not wish to speak of the general mercurial treatment ; far from such an idea, our means of treatment are much too rare to allow us to renounce a treatment which has given such proof that it can always and should often be applied concurrently with local treatment, for both are efficacious not only in syphilis, but in rheumatism, sympathetic ophthalmia, etc. We no longer believe that mercury, which is one of the most energetic antiseptics, acts on the syphilitic virus alone.

In several of the observations which I shall bring before your eyes the general treatment, either by frictions or by a long series of hypodermic injections, after a momentary improvement appeared to lose its effect. Subconjunctival injections of sublimate have produced in a very short time so marked an improvement of the visual acuity that it is no longer possible to deny, if not the superiority over the general treatment, at least its real efficacy.

This is all that I desire to demonstrate to-day. The following are the brief observations that I have to present to you :

CASE I.—BEGINNING CENTRAL CHORIO-RETINITIS. Fig. 1.

Miss B., twenty-five years ; no syphilitic antecedents. Disease dating from fifteen days :

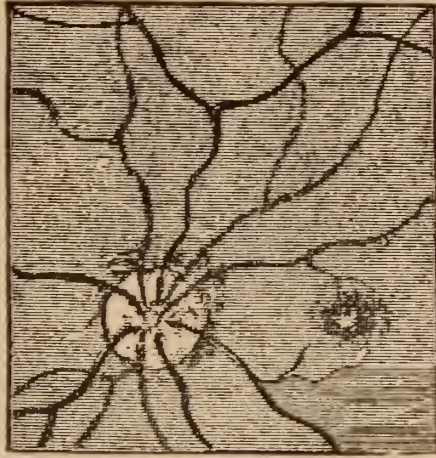


FIG. 1.

O. D. V. = 1. Reads No. 1 at twenty centimeters.

O. S. V. = $\frac{1}{4}$. Reads No. 4.

After eight days of mercurial frictions, no change.

After subconjunctival injections, with two days interval :

O. D. V. = 1. Reads No. 1.

O. S. V. = 1. Reads No. 1.

To complete the cure we made a series of twenty hypodermic injections of sublimate.

One year later we found no trace of the lesion.

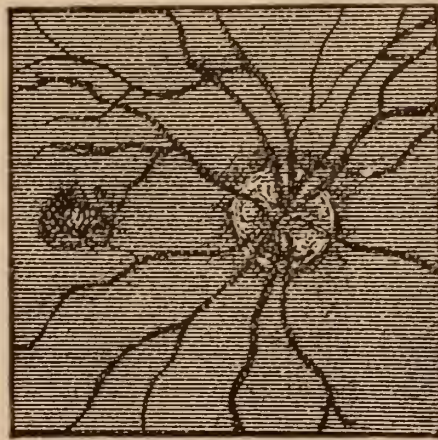


FIG. 2.

CASE II.—CENTRAL CHORIO-RETINITIS DATING FROM THREE MONTHS. Fig. 2.

M. T., thirty-eight years ; no syphilis.

After two months of mercurial frictions and of iodide of potassium :

O. D. V. = $\frac{1}{8}$. Reads No. 7 at twenty-five centimeters.

O. S. V. = 1. Reads No. 1.

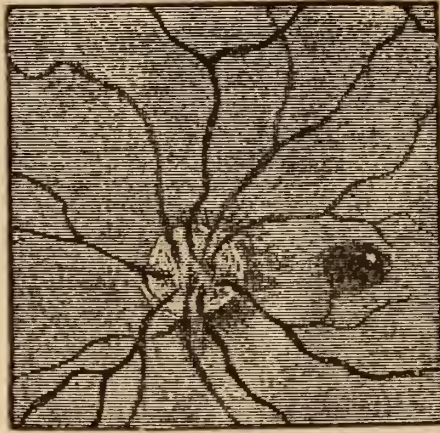


FIG. 3.

After three subconjunctival injections of $\frac{1}{20}$ of a milligram of sublimate :

O. D. V. = $\frac{1}{8}$. Reads No. 2.

After six subconjunctival injections :

O. D. V. = $\frac{2}{3}$. Reads No. 1.

O. S. V. = 1. Reads No. 1.

Anatomical lesions have almost disappeared.

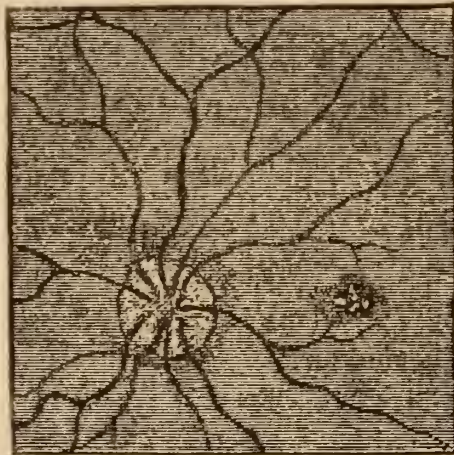


FIG. 4.

CASE III.—CENTRAL CHORIO-RETINITIS (HEREDO-SPECIFIC?).

Miss M., twenty-two years ; already cured of slight parenchymatous keratitis by subconjunctival and subcutaneous injections.

Recent macular focus :

O. S. V. = $\frac{1}{2}$. Reads No. 3 at twenty centimeters.

Slight metamorphopsia.

After eight subconjunctival injections :

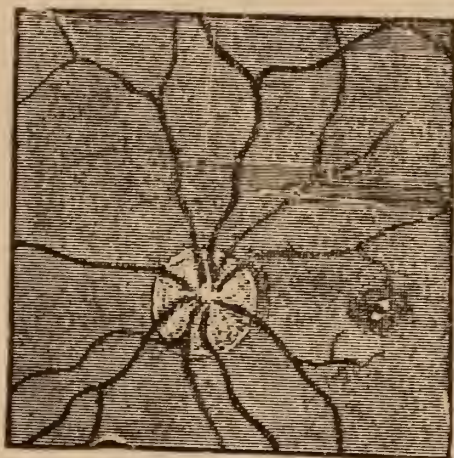


FIG. 5.

O. S. V. = 1. Reads No. 1.

Three months after the anatomical lesion persisted.

CASE IV.—MACULAR CHOROIDITIS. Fig. 4

M. S., twenty-one years ; no acquired syphilis. Since one month positive scotoma :



FIG. 6.

O. S. V. = $\frac{1}{4}$. Reads No. 3 at twenty-five centimeters.

After two subconjunctival injections, in nine days :

O. S. V. = $\frac{2}{3}$. Reads No. 1.

The patient, living in the country, has not returned ; he has continued the hypodermic injections of sublimate.

CASE V.—CENTRAL CHORIO-RETINITIS. Fig. 5.

M. C. D., forty-seven years ; gouty, but not syphilitic.

Since one month *positive scotoma* and *metamorphopsia* :

O. D. V. = 1. Reads No. 1 at thirty centimeters.

O. S. V. = $\frac{1}{2}$. Reads No. 1 badly.



FIG. 7.

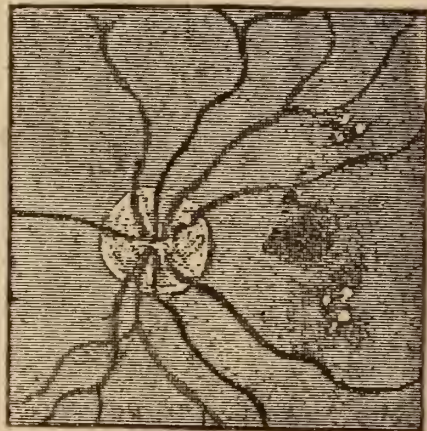


FIG. 8.

After two subconjunctival injections :

O. S. V. = 1. Reads No. 1 well.

In a few days the metamorphopsia has disappeared.

Returned one year later ; the fundus of the eye still presented the same lesions, with perfect vision.

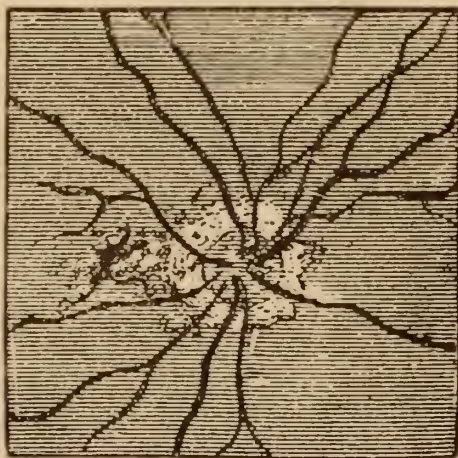


FIG. 9.

CASE VI.—CENTRAL CHORIO-RETINITIS. Fig. 6.

M. P., thirty-seven years. Severe and frequent attacks of gout ; never had syphilis. Myopia ; vision affected since fifteen days :

O. D. — 3 D. V. = $\frac{2}{3}$. Reads No. 1 at fifteen centimeters.

O. S. — 3 D. V. = $\frac{1}{4}$. Reads No. 1, badly.

After two subconjunctival injections :

O. S. — 3 D. V. = $\frac{2}{3}$. Reads No. 1 better.

After six injections in ten days, normal vision in both eyes, without cloudiness or metamorphopsia.



FIG. 10.

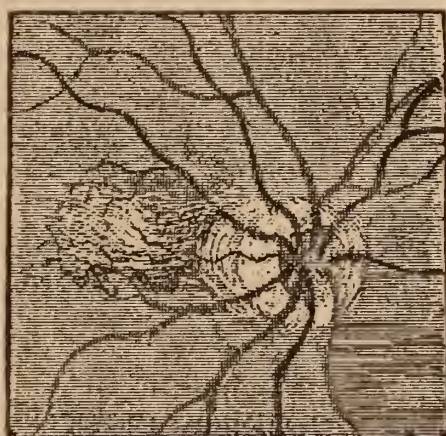


FIG. 11.

Three months later the anatomical lesions were very small. Vision normal.

CASE VII.—CENTRAL CHORIO-RETINITIS. Figs. 7 and 8.

M. Y., thirty-eight years; syphilis denied. Gouty antecedents. Beginning of the disease a year ago by a cloudiness of the vision.



FIG. 12.

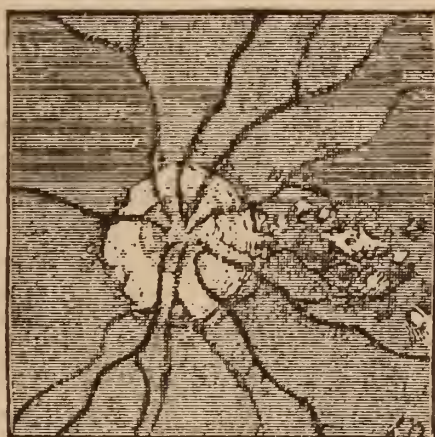


FIG. 13.

O. D. V. = $\frac{1}{2}$. Reads No. 2.

O. S. V. = $\frac{1}{30}$. Reads No. 4.

After one subconjunctival injection :

O. D. V. = $\frac{1}{2}$. Reads No. 2.

O. S. V. = $\frac{1}{2}$. Reads No. 1.

After three subconjunctival injections he departed. He returned after twenty hypodermic injections :

O. D. V. = $\frac{1}{2}$. Reads No. 1.

O. S. V. = $\frac{1}{3}$. Reads No. 2.

After ten subconjunctival injections :

O. D. V. = $\frac{2}{3}$. Reads No. 1.

O. S. V. = $\frac{2}{3}$. Reads No. 1.

This condition is maintained to-day.

CASE VIII.—MYOPIC MACULAR CHOROIDITIS. Fig. 9.

M. F., fifty years.

O. D. + 1.5 D. V. = $\frac{2}{3}$. Reads No. 1 with + 3. D.

O. S. - 12. D. V. = $\frac{1}{10}$. Reads No. 4.



FIG. 14.—O. D.

After three subconjunctival injections :

O. S. - 9. D. V. = $\frac{1}{2}$. Reads No. 1.

The muscæ volitantes have diminished greatly.

Only one injection a week.

Three months later : the vision remains very good ; no anatomical change.

CASE IX.—MYOPIC MACULAR CHOROIDITIS. Figs. 10 and 11.

M. C. ; vision much lessened during the last six months ; muscæ volitantes.

O. D. V. = $\frac{1}{100}$. Reads No. 9, with difficulty.

O. S. V. = $\frac{1}{40}$. Reads No. 5, with difficulty.

After six subconjunctival injections :

O. D. V. = $\frac{1}{40}$. Reads No. 8.

O. S. V. = $\frac{1}{12}$. Reads No. 4.

After fifteen injections in six weeks :

O. D. V. = $\frac{1}{15}$. Reads No. 8.

O. S. V. = $\frac{1}{10}$. Reads No. 4.



FIG. 15.—O. D.

Glasses have never increased the vision. The patient is much better and can work, which he has not been able to do for six months past.

CASE X.—MYOPIC MACULAR CHOROIDITIS. Figs. 12 and 13.

M. G., fifty-two years ; denies all syphilitic antecedents.

O. D. — 10. D. V. = $\frac{1}{3}$.

O. S. — 12. D. V. = $\frac{1}{3}$.

After four subconjunctival injections :

O. D. — 11. D. V. = $\frac{1}{2}$.

O. S. — 11. D. V. = $\frac{2}{3}$.

The patient, less annoyed by cloudiness of vision, can work.

Returned three months later in the same condition.

CASE XI.—DISSEMINATED CHOROIDITIS. Fig. 14.

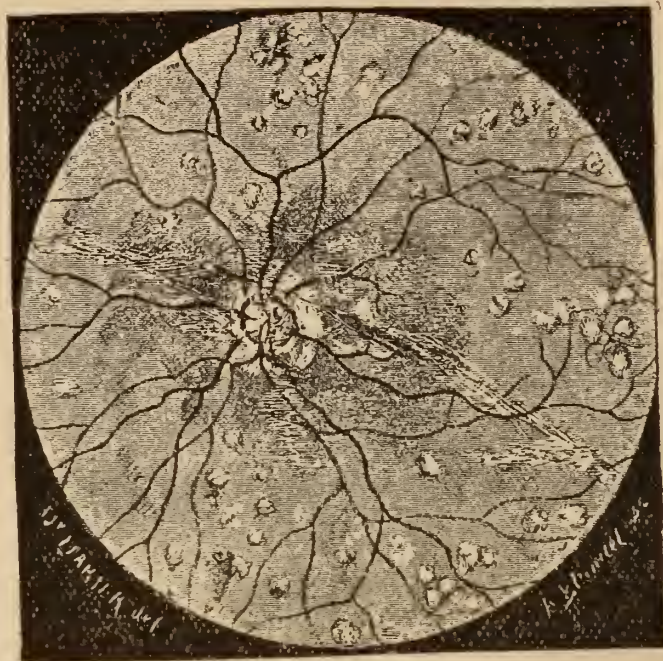


FIG. 16.—O. D.

M. B., seventeen years. No syphilis. Identical lesions in both eyes.

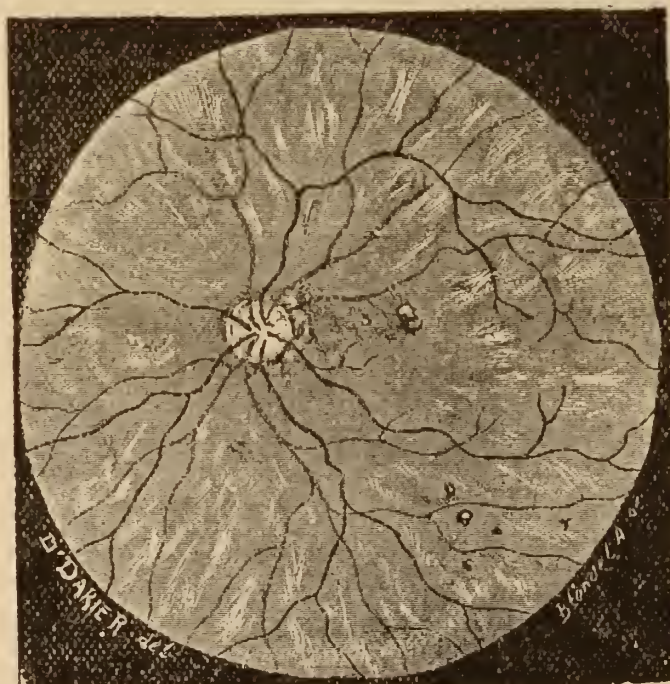


FIG. 17.—O. D.

O. D. V. = $\frac{1}{4}$. Reads No. 6.

O. S. V. = $\frac{1}{8}$. Reads No. 8.

After twenty hypodermic injections :

O. D. V. = $\frac{1}{3}$. Reads No. 5.

O. S. V. = $\frac{1}{8}$. Reads No. 7.

After six subconjunctival injections :

O. D. V. = $\frac{1}{3}$. Reads No. 1.

O. S. V. = $\frac{1}{3}$. Reads No. 2.

Returning three months later the patient has the same visual acuity.

CASE XII.—DISSEMINATED CHOROIDITIS. Fig. 15.

M. D.; nineteen years. Both eyes in same state ; no syphilis.

O. D. V. = $\frac{1}{6}$. Reads No. 1.

O. S. V. = $\frac{1}{8}$. Reads No. 8.



FIG. 13.—O. D.

After thirty hypodermic injections :

O. D. V. = $\frac{1}{4}$. Reads No. 1.

O. S. V. = $\frac{1}{6}$. Reads No. 3.

After eighty hypodermic injections :

O. D. V. = $\frac{1}{6}$. Reads No. 2.

O. S. V. = $\frac{1}{8}$. Reads No. 5.

After six subconjunctival injections :

O. D. V. = $\frac{1}{4}$. Reads No. 1.

O. S. V. = $\frac{1}{6}$. Reads No. 3.

After twenty subconjunctival injections :

O. D. V. = $\frac{1}{2}$. Reads No. 1.

O. S. V. = $\frac{1}{4}$. Reads No. 2.

CASE XIII.—DISSEMINATED CHOROIDITIS, WITH OPACITIES OF THE VITREOUS. Fig. 16.

M. C., fifty-two years. Syphilis denied. Grave anæmia for one year. Visual disturbances dating from eight months.

O. D. V. = $\frac{1}{4}$. Reads No. 3.

O. S. V. = $\frac{1}{10}$. Reads No. 7.

After two subconjunctival injections :

O. D. V. = $\frac{1}{3}$. Reads No. 3.

O. S. V. = $\frac{1}{3}$. Reads No. 3.

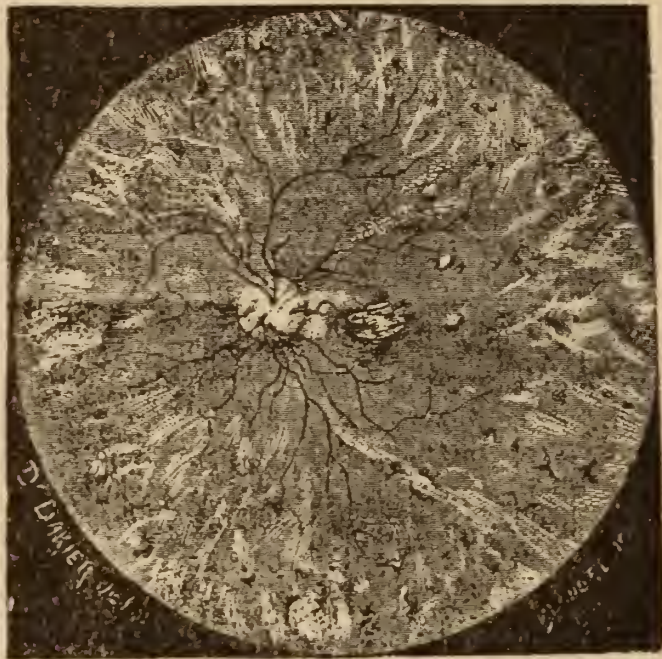


FIG. 19.—O. D.

Subconjunctival injections were combined then with hypodermic injections :

O. D. V. = $\frac{1}{3}$.

O. S. V. = $\frac{2}{3}$.

CASE XIV.—DISSEMINATED CHOROIDITIS. Fig. 17.

M. G., thirty-eight years ; both eyes similar. Syphilis ignored.

O. D. V. = $\frac{1}{3}$. Reads No. 1.

O. S. V. = $\frac{1}{2}$. Reads No. 1.

After forty hypodermic injections :

O. D. V. = $\frac{1}{3}$.

O. S. V. = $\frac{1}{3}$.

After four subconjunctival injections :

O. D. V. = $\frac{2}{3}$.

O. S. V. = $\frac{2}{3}$.

The patient was then also subjected to a series of twenty subconjunctival and hypodermic injections :

O. U. V. = $\frac{2}{3}$.

CASE XV.—SYPHILITIC CHORIO-RETINITIS. Fig. 18.

M. C., forty-two years ; both eyes in same state.

O. S., corneal leucoma.

O. D. V. = $\frac{1}{4}$. Reads No. 3.

O. S. V. = $\frac{1}{10}$. Reads No. 4.

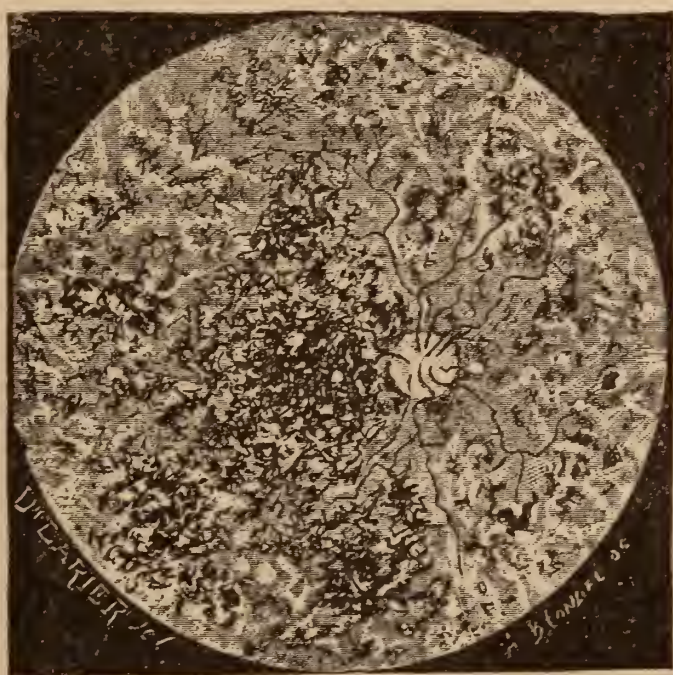


FIG. 20.—O. D.

After two subconjunctival injections :

O. D. V. = 1. Reads No. 1.

O. S. V. = $\frac{1}{10}$. Reads No. 1.

The treatment was continued by hypodermic injections for three months.

CASE XVI.—SYPHILITIC CHORIO-RETINITIS WITH ATROPHY OF THE PAPILLA SIMULATING PIGMENTARY RETINITIS. Fig. 19.

M. M., forty-nine years. For two years the patient has been subjected to mercurial frictions, then to hypodermic injections of sublimate.

O. D. V. = $\frac{1}{8}$. Reads No. 8.

O. S. V. = $\frac{1}{8}$. Reads No. 8.

After forty hypodermic injections :

O. D. V. = $\frac{1}{10}$. Reads No. 8.

O. S. V. = $\frac{1}{10}$. Reads No. 8.

After ten subconjunctival injections :

O. D. V. = $\frac{1}{4}$.

O. S. V. = $\frac{1}{2}$.

After twenty subconjunctival injections :

O. D. V. = $\frac{1}{2}$.

O. S. V. = $\frac{1}{2}$.

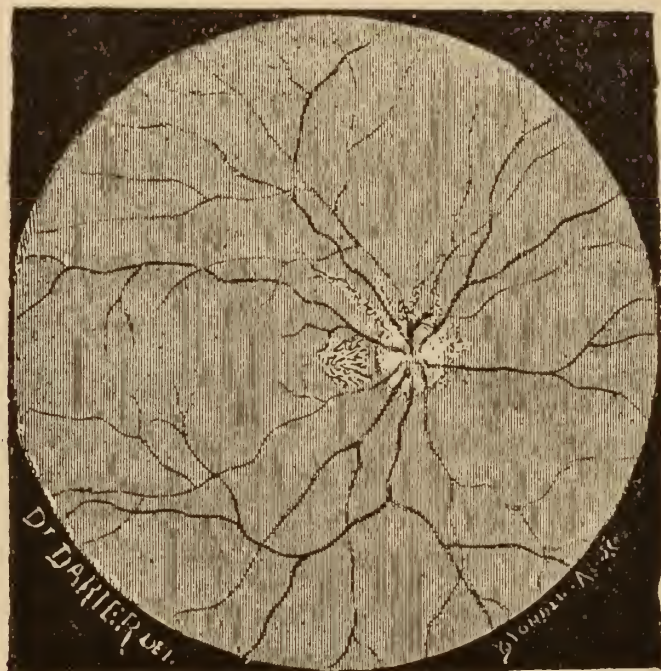


FIG. 21.—O. D.

The subconjunctival injections were then alternated with hypodermic. To-day :

O. D. V. = $\frac{1}{4}$. Reads No. 4.

O. S. V. = $\frac{1}{3}$. Reads No. 5.

CASE XVII.—GENERALIZED CHOROIDITIS OF PIGMENTARY FORM. ATROPHY OF THE VESSELS. HEREDITARY SYPHILIS.
Fig. 20.

M. O., fifteen years.

O. D. Sees the hand moving.

O. S. V. = $\frac{1}{6}$. Scarcely reads No. 1.

After thirty-seven hypodermic injections :

O. D. Counts fingers at twenty centimeters.

O. S. V. = $\frac{1}{6}$. Reads No. 2.

After seven subconjunctival injections :

O. D. V. = $\frac{1}{20}$. Reads No. 8.

O. S. V. = $\frac{1}{8}$. Reads No. 2.

The treatment was continued by combining subconjunctival with hypodermic injections.

CASE XVIII.—NEURO-RETINITIS (OF UNDETERMINED NATURE). Fig. 21.

No syphilis ; never albumen in the urine.

O. D. V. = $\frac{1}{4}$. Reads No. 7.

O. S. V. = 1. Reads No. 1.

After seven or eight subconjunctival injections the vision did not improve, but the lesions were less.

After three months the vision was $\frac{1}{4}$; but the lesions have disappeared. Only the papilla has a whitish tint.

This case is one of those rare ones where the anatomical lesions have been really modified.

DIPHTHERIA.*

BY J. B. GARRISON, M. D., NEW YORK.

Aretæus of Cappadocia was probably the first to give a good description of the disease, and he termed it "Syriac ulcer." Baillou of Paris was the first to speak of the false membrane, in 1576.

Peter Forestrius, 1557, Von Woerd (Holland), Joannes Wierus (Dantzic), Coligni (Augsburg), 1565—all speak of epidemics which were probably diphtheric. It was first noticed and spoken of in America in the seventeenth century. Bretonneau in 1821 wrote a paper describing it, in which he claimed identity with membranous croup. He claimed also that it was purely a local disease. This point has long been discussed, but it seems to be settled that it is highly probable that it is excited by some form of bacterium. That it is highly contagious seems to admit of no doubt.

The methods of transmission most usual are a polluted water supply, bad drainage, milk of diseased cows, clothing previously infected and then exposed in the presence of the victim, and dogs, cats, and even birds, as pigeons, are said to have been the means of conveyance.

The ordinary cases I shall not speak of, but there is a class that I am especially interested in, and one that I have learned to have great respect for, and I beg to note two or three cases that have come under my notice.

CASE I. Lillie J., æt. eleven, came home from school at noon complaining of a severe headache; had been well in the morn-

* New York State Homeopathic Medical Society, October 5, 1892.

ing. I saw her early in the evening, and found her with flushed face, restless, temperature $99\frac{4}{5}^{\circ}$, pulse 100, some pain on swallowing, tonsils very slightly changed in color, and only slightly, if any, larger than they were accustomed to be, and a very small point of exudation on one of them—I forget which now.

My cases of diphtheria had all of them had a high temperature previously, and I left thinking it was to be a light case. The next day the temperature rose to a trifle over 100° , and the patch spread over a larger surface. The pain in swallowing was only slight and the appetite was fair. But the patch became still larger, and the other tonsil became affected, and the third day the temperature was 101° , and the tonsils looked as if they were covered with pieces of wet chamois skin, which adhered tightly to the surfaces of the glands.

I was also worried when I noticed a hoarseness, and on my second visit at noon I found it had increased, and told the family that I feared there was more danger than I had at first anticipated, and suggested a consultation. Professor C. E. Beebe was sent for and met me at the bedside in the evening, when he at once refused to operate and gave a most unfavorable prognosis. She died on the fifth day, lying in a comatose condition for about two hours previously.

CASE II. Paul S., æt. five, complained of being sick after breakfast, and I saw him about ten o'clock. Was playing on the floor; said his throat was sore. Temperature 100° , and small, white patch on left tonsil. The mother said she did not think he was very sick, but thought best to send for the doctor before there was any danger. I allowed her to see the throat, and told her that although there was very little swelling and not much of a patch, I believed there was a great deal of danger, and told her I feared it more than if it looked much worse.

The temperature never ran above 101° , but the membrane spread, assuming the same general appearances described in Case I. On the fourth day the disease invaded the larynx, and on the fifth I intubated, with only partial relief, and on the sixth day he died.

These cases were the first and last of the kind I saw, and I would like to know if others have had in their

practice cases of the same character with as high a rate of mortality.

In the first case there were no other children, but in the last one there was a younger brother who, despite all my protests, was allowed to come in the room where the sick child was at will. To him I gave apis 3 several times a day as a prophylactic and he escaped entirely.

For several years I have made it a rule to administer apis to the well children of the family when a diphtheritic case came under my care, and in no instance have I had a second case where I have prescribed it. Isolation and disinfection I believe to be absolutely necessary, and always insist on their being carried out, but in some cases the isolation at least is about impossible. The treatment in my opinion should be by internal medication, local swabbing and scrubbing only irritating the patient and not reaching the seat of the poison.

The use of H_2O_2 in the form of a spray has seemed beneficial, and is so mild that all will submit to it, and I frequently use it.

Hygiene must be carefully attended to and the strength kept up by every means possible.

Perfect rest must be insisted upon, and that too after the membrane has disappeared entirely.

A CASE OF NUCLEAR IRIDOPLEGIA.*

BY CHAS. C. BOYLE, M. D., NEW YORK.

Mrs. C., aged forty-eight, consulted me in May, 1889, on account of headaches from which she suffered, thinking that her eyes might be the cause of them, as she often had diplopia.

On examination found R. V. = $\frac{20}{70} + .75$ D^s. $\ominus + .25$ D^c. ax. $90^\circ = \frac{20}{40}$; L. V. = $\frac{20}{100} - 1$. D^s. $\ominus - .50$ D^c. ax. $165^\circ = \frac{20}{40}$.

Phorometer showed exophoria 5° for distance and 8° for near vision. Left hyperphoria 1° .

Ophthalmoscopic examination showed a normal fundus, except that in the left eye there was a small posterior staphyloma. Pupils normal. Besides prescribing glasses, I commenced treatment by trying to strengthen the muscles by exercising with prisms. At first the internal recti could not overcome more than a 10° prism, and instead of improving they gradually grew weaker, until finally they could not overcome more than a prism of 2° . At this stage, although not a believer in the theory that tenotomy of the eye muscles will cure all the ills that flesh is heir to, I advised tenotomy of the external recti, which was consented to and performed, and was followed by greater relief, although not entire cessation from headaches, than she had had for years. From the time I first saw patient, vision gradually grew less; in May, 1889, it was $\frac{20}{40}$ with glasses; in September, 1889, R. V. = $\frac{20}{70}$, L. V. = $\frac{20}{100}$; in May, 1890, V. = $\frac{20}{100}$; in May, 1891, V. = $\frac{20}{200}$; in June, 1891, V. = $\frac{13}{200}$, and since then it varies from $\frac{10}{200}$ to $\frac{6}{200}$ O. U. About one year ago noticed that the pupils had become dilated to about their full extent; tension normal. Pupils would not contract from the action of light, showing a loss of the reflex action; the power of accommodation was not affected, but

* New York State Homeopathic Medical Society, October 5, 1892.

the pupils did not contract when patient was using accommodation. A solution of sulphate of eserine 1-200 caused no contraction. At times while under treatment there would be a very slight contraction of the pupil, but it did not remain long, and at the present time they remain dilated to about their full extent. For the last year the patient has been troubled for a good part of the time with a passive congestion of the ocular conjunctiva, unaccompanied by any catarrhal discharge from the eyes, showing it was not a catarrhal condition, but probably due to the same causes that were affecting the eye otherwise.

Have examined the eye repeatedly for commencing atrophy of the optic nerve, but cannot discover any ; in fact, the disks look the same as when I first saw the patient.

Field of vision very much contracted now, but there is no loss of color vision, and the patient apparently suffers very little inconvenience from her loss of vision ; goes around as she always did, and can read ordinary print with her near glasses that I prescribed when I first saw her, with very little inconvenience, and this I consider a remarkable feature of the case, considering the loss of vision for distance. There is hardly any doubt but that atrophy of the optic nerve will make its appearance at some time in the future, but from the history of the case you would have expected it long ago.

Her trouble is probably due to some lesion in the brain, undoubtedly in the region of the nucleus of the third nerve, because it is in this region that the nerves that control the action of the iris originate.

It has been found that the nucleus of the third nerve contains a series of centers corresponding to the several functions of the nerve: the most anterior related to accommodation, the next to the reflex action of the iris, while the remainder of the nucleus controls most of the recti muscles.

The path through which the reflex action of the iris is produced is the optic nerves, both optic tracts, corpora quadrigemina, and the anterior part of the nucleus of the third nerve behind the center of accommodation.

In this case the dilatation of the pupil and loss of reflex

action of the iris are probably due to some trouble in the brain at the seat of the anterior part of the nucleus of the third nerve, which controls this action. The partial loss of vision would also have something to do with this dilatation of the iris, and loss of reflex action.

Notwithstanding the loss of vision, the patient's eyes are sensitive to light, so that she wears smoked glasses in the street, and ophthalmoscopic examination is always more or less painful. In the treatment of this patient I have given different remedies that seemed to be indicated, besides using electricity, both galvanic and faradic currents, but nothing seemed to be of any use. Have had the patient examined by Dr. O'Connor, who also gave his opinion that the trouble was due to some central lesion.

A FOREIGN BODY IN THE CONJUNCTIVA.

BY W. BIRDSALL HUNT, M. D., ST. PAUL, MINN.

The following interesting case came under my observation in Michigan, June 17, 1891.

Mr. G., a wealthy farmer, while feeding his stock one morning in March, 1891, felt something in his eye, and immediately began rubbing the optic with his hand. He experienced the most excruciating pain, but kept on "rubbing."

He consulted his family physician, who looked in vain for a foreign body. Severe inflammation soon followed, attended with great pain. This condition continued for two months, a profuse discharge of pus bathed the cheek, the lids were swollen and puffy, giving the appearance of gonorrheal ophthalmia (the writer had a passing glance at the eye about two months after the trouble began); chemosis threatened the destruction of the cornea. pain still intense; he walked the floor night after night. He finally concluded to consult a specialist and went to Grand Rapids for that purpose.

After ten days' treatment, the inflammation being somewhat subdued, and being assured by his physician that no foreign body was present (Mr. G. insisting that there was), he returned home. Being well acquainted with him, I asked to be allowed to make an examination, which was gladly consented to. He came into my office wearing a slippery elm poultice over the eye.

On inspection the globe appeared slightly smaller than its fellow, cornea clear, severe conjunctivitis and chemosis in the nasal side, while the temporal side was but slightly inflamed, leading me to suppose there must be a foreign body present to keep up the congestion, which was localized.

Having thoroughly cleansed the eye with a weak solution of car-

bolic acid, I made an exploring tour with a probe, in the direction of the oozing pus, and immediately came in contact with a hard substance.

Removing the probe, and taking a small pair of forceps, following the same direction as with the probe, I grasped the foreign body and slowly extracted a beard of "June grass" $1\frac{3}{4}$ inches long, which had been imbedded in the ocular conjunctiva for three months. The direction taken by the foreign body was as follows: entering about six or seven millimeters from the cornea in the nasal side, it extended backward and outward. It is needless to add that rapid recovery followed.

DISLOCATION OF THE LENS AND SUBSEQUENT CATARACT BY A SHOT FROM AN AIR GUN.*

BY ALTON G. WARNER, M. D., BROOKLYN, N. Y.

The peculiarity of this case is the fact that the lens was not touched or the eyeball perforated, but the luxation occurred as the result of shock. The patient, a boy of fourteen, I saw at the request of Dr. Chapin. Two days before an air gun in the hands of a younger brother had accidentally been discharged and the patient felt the shot strike his eye. Upon examination I found the eyeball much inflamed and rather sensitive to touch, the pupil dilated, and iris tremulous, showing that it was not supported by the lens, which was dislocated directly backward. For some time I could not find any trace of the shot, but rolling the eyeball as far downward as possible and drawing the upper lid well up, I discovered the shot beneath the conjunctiva, but without the sclera. The lid was not wounded at all. A slight incision in the conjunctiva released the shot and it popped out. A dressing of calendula with aconite internally soon restored the eye to normal condition, except the lens. This soon became opaque, as dislocated lenses are prone to do. A portion of the lens has since become absorbed, so that there is some peripheral vision. I have no doubt but that the whole lens could be absorbed by needling and clear vision obtained could the family be induced to give consent to the operation.

* New York State Homeopathic Medical Society, October 5, 1892.

NOTES ON WORD-BLINDNESS AND ITS CONCOMITANTS. A FRAGMENTARY CONTRIBUTION.

BY H. H. CRIPPEN, M. D., AND F. F. CASSEDAY, M. D.

(Continued from page 369).

The history of word-blindness is confused with that of aphasia, reaching backward to a period estimated at about the year 200 A. D. Although Trousseau is credited with introducing the word aphasia into modern science, it has been found in the "Hypotyposes" of Sextus Empiricus (translation from the Greek, Amsterdam, 1725, p. 93),* which appeared at about the date above noted. As aphasia was long made to cover a multitude of disturbances in the various manifestations of thought, such as in speech, writing, drawing, music, calculations, etc., it is difficult to obtain any clearly defined history of word-blindness until 1876, when Kussmaul (in his work "Sur les troubles de la parole"), created the term blindness for words and gave a complete description of the disease, furnishing four cases as the foundation of his observations.

Since the time of Kussmaul, numerous cases of this disease have been reported, and it has been found that it is sometimes a concomitant of other conditions, among which we find hemianopsia, paralytic conditions of the upper and lower limbs, word-deafness, etc. It has also been determined that there are some abnormal conditions that are wholly dependent upon mental blindness, among which we may cite sensory agraphia.

* "De la cécité et de la surdité des mots, dans l'aphasia," par. Mlle. Nadine Skwortzoff, Paris, 1881.

Later observations have shown, too, that mental blindness may mean much more than simple word-blindness; indeed, that it may not include this condition at all, for we may find only a loss of the power of mental vision for form and color, a loss of the power of playing a musical instrument from failure of the notes to represent to the mind a musical language, a loss of the faculty of carrying images in the memory (in a painter) so that in order to copy the model must be constantly in view, or a loss of the memory of mental imagery. Such are some of the clinical varieties of mental blindness that are usual concomitants of word-blindness, but that may also exist alone. It is plain that they are all varieties of apraxia or loss of object memories. The clinical description of these forms of mental blindness in their relation to word-blindness now concerns us.

We have already described two cases of word-blindness, but, as they convey some unusual features, we turn for the ordinary variety to that included in a case of psychical blindness reported by Macewen, of Glasgow.*

A man who had received an injury a year previous to his applying for treatment suffered from deep melancholy and strong homicidal tendencies, which were relieved by paroxysms of pain in the head. There were no motor phenomena, but it was discovered that immediately after the accident, and for two weeks subsequently, he had suffered from psychical blindness. Physically he could see, but what he saw conveyed no impression to his mind. An object presented itself before him which he could not make out, but when this object emitted sounds of the human voice he at once recognized it to be a man. In attempting to read, he saw what he considered must be letters and words, but they were unknown symbols to him; they conveyed no impression of their meaning; the memory of their signs was gone; the book was a sealed book to him. These phenomena gave the key to the hidden lesion in the brain. On operation, the angular gyrus was exposed; and it was found that a portion of the inner table of the skull had been detached from the outer, and had produced pressure on the posterior portion of the supra-marginal convolution, while a corner of it had penetrated and lay embedded in the an-

* *British Medical Journal*, August 11, 1886.

terior portion of the angular gyrus. Removal of the bone resulted in perfect recovery from the pain and mental symptoms.

Such mental symptoms are among the usual accompaniments of word-blindness, yet we have some comparatively rare cases on record where the only condition is one in which the memory of the appearance of the word is lost, the visual image of it cannot be called to mind or recognized. The subject is unable to read because the shapes of the letters and words seen arouse no recollection. Such subjects may be able to read raised letters and words by tracing them with the finger. They may also be able to play at cards and others games. They may be able to write from dictation but not to write spontaneously or to copy written or printed letters and words. This brings us to the association of *agraphia* with word-blindness.

On the subject of verbal blindness with *agraphia*, Déjerine * makes some interesting remarks, as follows :

“ The question of *agraphia*, of its symptomatology, as well as the lesions from which it arises, is quite complete. Described for the first time by Marcé, then by Ogle, who proposed the term *agraphia* to designate the symptom, it has been studied by Pitres, Charcot, Wernicke, and Lichtheim. Certain authors have admitted (Exner, Charcot) the existence of a special center for the movements of writing, a center which would be placed in the posterior part of the second frontal convolution of the left side. This opinion is based on Exner's researches, but the facts on which it reposes are not absolutely demonstrative. Thus, as Wernicke remarks, the act of writing is reduced in sum to a copy of the optic image of letters and words, and nothing proves that this act depends upon a special and autonomous center which plays in writing the same rôle as Broca's convolution for spoken language.

“ The movements of writing are in fact completely comparable to those which consist in copying any linear design, only differing because habit and education have perfected them and rendered execution easy and prompt. To demon-

*“ *Recueil d'ophtalmologie*, "1891, p. 623.

strate the existence of an independent graphic motor center, an autopsy is necessary in which agraphia depends solely upon a lesion of this presumed center, and without lesion of the centers of optic and tonal memory, as well as of Broca's convolution. To the present day, no fact of this kind has been found.

"As the faculty of writing is subordinated to the faculty of reading mentally, since, according to Wernicke's expression, writing only consists in the act of copying our images of optic memories of letters, it is necessary to expect agraphia to appear in two principal conditions, (1) when the center of optic memory is destroyed, and (2) when the connections of this same center, either with Broca's convolution, or with the motor zone of the upper limb, are interrupted.

"I have for report an observation, with autopsy, of a subject agraphic in consequence of the destruction of the angular gyrus of the left side, consequently belonging to the first category. This was a man of sixty-three years, who, some time after his entrance to the Bicêtre, found one morning that he could no longer read his paper. In examining this patient we found the existence of a complete verbal blindness with right hemianopsia, without a trace of optic aphasia or of psychological blindness. The ataxia was total, the patient being completely unable to grasp the signification of letters and words, either written or printed. No verbal deafness. Slight disturbance in speech, consisting of a slight degree of paraphasia.

"When the subject is asked to write spontaneously, without dictation or in copying, he only traces some unformed characters, in which we recognize with difficulty some letters of his name. During six months the symptoms remained the same. On autopsy we found in the left hemisphere the existence of a yellow plaque the size of a dollar piece, terminating by a point at the external perpendicular fissure. The remainder of the cortex was absolutely intact. On section (Flechsig), this softening of the angular gyrus extended in the form of a wedge into the subjacent white substance to about one centimeter from the ventricular wall, destroying Gratiolet's optic radiations."

So far as the localization of verbal blindness is concerned this case is one of the most demonstrative published. Some further remarks on the explanation of the agraphia and of the hemianopsia will be found in the tabular analysis of cases which appears later on.

The association of verbal blindness with a loss of mental imagery, that is with suppression of the power of recalling at will a mental vision of signs and objects (forms and colors), appears to be a somewhat rare condition. Bernard takes from Charcot's clinic* an exceedingly clear case of this kind.

This case was that of a highly educated man. Until a year previous he had enjoyed a remarkable memory, especially a *visual* memory. *Mental vision* gave him, at will, the representation of traits of persons and the form and the color of objects with as much clearness and intensity as the reality itself. If he sought a fact or a figure in his voluminous correspondence, conducted in several languages, he immediately found it in the letters themselves, which appeared to his mental vision in their exact tenor, even to the smallest details, irregularities, and erasures. If he wished to recite from a favorite author, he read in his memory from the page presenting itself to mental vision.

Auditive memory, however, was always lacking in this patient, or at least he only possessed it in a second rank. Among other things, he never had a taste for music.

During a year and a half he has been greatly disturbed by some debts, the payment of which seemed uncertain. He lost appetite and sleep, and one day he was suddenly struck by finding a great change in himself. He believed at first in the fear of mental alienation, things seemed so new and strange around him. Visual memory of forms and colors had completely disappeared. To-day he recognizes and understands the change.

Each time that this patient returns to the city where he resides, it seems to him like entering a new place. He looks with astonishment at the statues, the streets, and the houses. If asked to describe his own house, he cannot recall to memory any of its details. Visual memory of his wife and children is impossible.

* *Revue Clinique d'Oculistique*, t. iii. p. 121.

The examination of the eye yields no results. There are no ocular lesions or functional disturbances.

Besides this loss of the faculty of visual representation of objects, verbal blindness exists in this patient to a certain degree. Asked to read the Greek and the German alphabets, he omits several letters of the series, and can only recognize them by tracing them himself.

It is quite remarkable that, with so great a degree of apraxia, the verbal blindness was so small a factor in this case. It is also unfortunate that among the cases of loss of mental imagery we have been able to collect, no autopsy has been obtained. Among analogous cases that we have obtained from the literature of this subject are the following :

In a diabetic patient of sixty-eight years, Cotard reports* loss of mental vision with regard to the power of reproducing a mental picture of familiar objects. This case does not appear to have been examined carefully for verbal blindness and there are strong probabilities that this condition was present.

Charcot† cites the case of a painter, in whom there was loss of the faculty of carrying images in the memory, so that in order to copy he was obliged to have the model constantly under his eyes, in such a way as not to lose sight of it a single instant.

In another case Charcot relates the history of a subject affected by verbal blindness to a slight degree in whom there was an entire loss of the faculty of mental vision for form and color.

These cases will be further commented on in the tabular analysis.

So far as the pathology of word-blindness is concerned, we prefer to present this subject by introducing the accompanying plate (Fig. 3),‡ which illustrates the opinions of

* *Revue Clinique d'Oculistique*, t. iv. p. 102.

† *Revue Clinique d'Oculistique*, t. iii. pp. 121 and 128.

‡ Reproduced from Dr. M. Allen Starr's work on "Familiar Forms of Nervous Disease."

several prominent authorities, and by a series of cases, which we have carefully tabulated for the purpose of show-

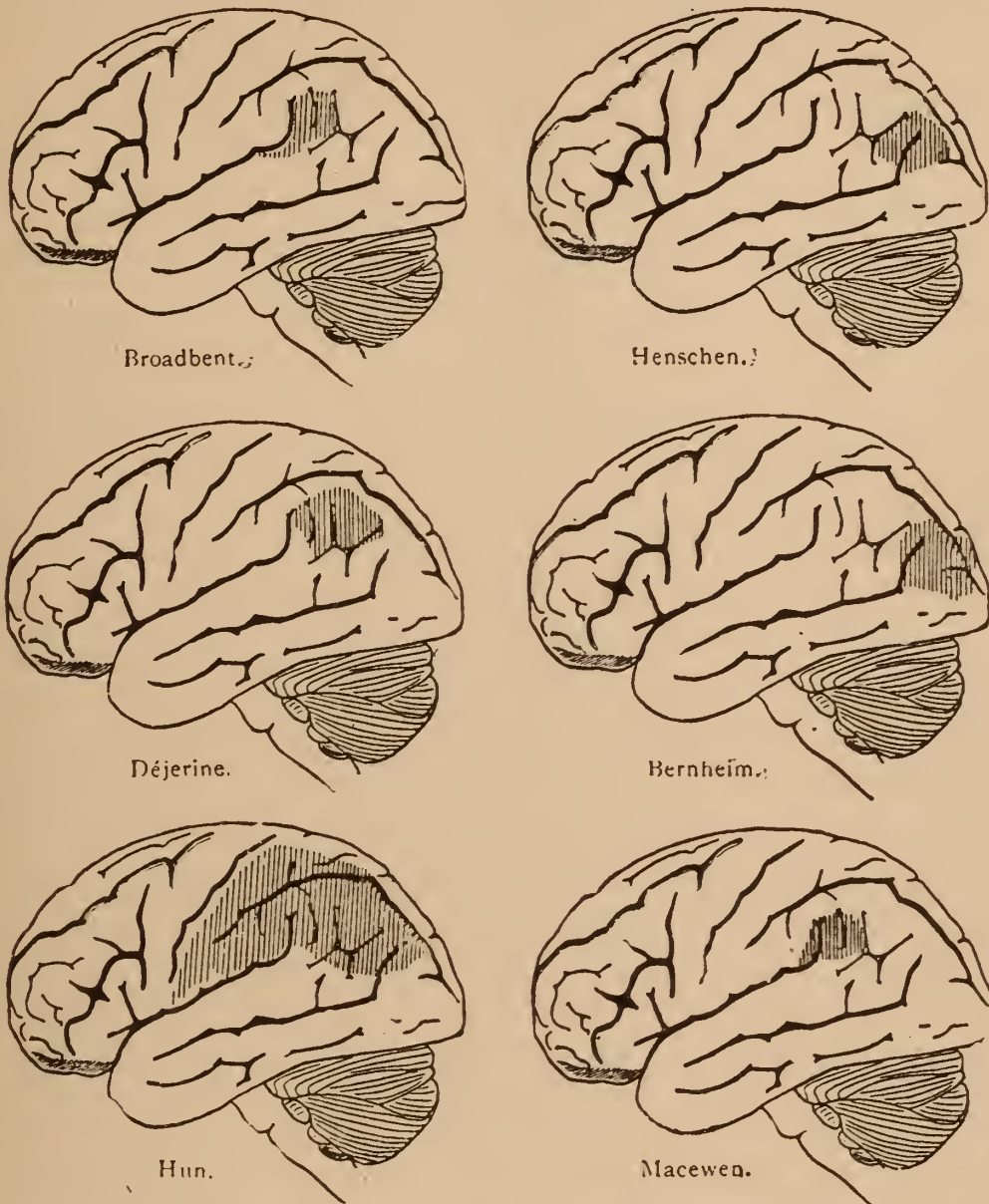


FIG. 3. - The Situation of Lesions causing Word Blindness only.

ing the concomitant conditions and the localization of the cerebral lesions.

CASES OF WORD-BLINDNESS WITH ASSOCIATED CONDITIONS.

CASE I.

Reporter.—Déjerine (*Rec. d'Oph.*, 1891, p. 623).

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Agraphia. Alexia. Paraphasia.

Symptoms Relating to the Eyes.—Right hemianopsia.

Result.—Symptoms remained the same for six months. Death.

Autopsy.—Yellow deposit, size of a dollar, in left hemisphere, terminating in a point on the external perpendicular fissure (sulcus centralis). On section, this softening extended in wedge form into the subjacent white tissue to about a centimeter from the ventricular wall, destroying Gratiolet's optic radiations.

Remarks.—Here the lesion is exactly limited to the angular gyrus, with complete integrity of the occipital convolutions and of the cuneus. The right hemianopsia finds its explanation in the destruction of Gratiolet's optic radiations. The agraphia can only be explained by the destruction of the center of memory for words.

CASE II.

Reporter.—Déjerine (*Rec. d'Oph.*, 1891, p. 371).

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Verbal deafness. Verbal blindness. Agraphia for spontaneous and dictated writing, but the act of copying was relatively preserved.

Symptoms Relating to the Eyes.—Right hemianopsia.

Result.—Condition lasted four months, terminating in stupor, coma, and death.

Autopsy.—Yellow plaque of deposit on the external face of left hemisphere, commencing at the posterior half of the inferior two-thirds of the ascending parietal, leaving intact Rolando's fissure. This plaque involved all of the foot of insertion of the inferior parietal as well as the folds of the vertical passage linking this convolution to the upper parietal, and exactly followed the interparietal fissure. This plaque, which occupied the whole of the inferior parietal convolution (supra-marginal gyrus and angular gyrus), also occupied the posterior part of the first and second temporal and of the second occipital convolution. The softening extended into the white subjacent substance to the ventricular wall, destroying Gratiolet's fibers. The frontal lobe was absolutely intact, and Broca's convolution, examined under the microscope, did not present granular bodies.

Remarks.—In this case the centers of optic and of tonal memory of words were destroyed. The right hemianopsia depended, as above, on the destruction of the optic radiations.

CASE III.

Reporter.—Glynn (*Brit. Med. Jour.*, January 4, 1890).

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Could not use his tools and had in great part forgotten their names and uses. When the author saw this subject the mental blindness only prevented recognition of written and printed words, as well as some isolated letters.

Symptoms Relating to the Eyes.—Right hemianopsia of the right eye, with contracted field. Vision of left eye limited to the macula.

Results.—Raising of depressed bones over the occipital lobe allowed a portion of the visual field to be regained.

Remarks.—An adult, in a fall, fractured the skull in the occipital region. Soon after the accident the foregoing symptoms appeared.

CASE IV.

Reporter.—Serieux (*L'Art. Méd.*, t. lxxiv. p. 44).

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—"Verbal blindness. Cortical deafness. Disturbance of speech and of writing."

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Softening at the lobe of the angular gyrus of the left hemisphere. Integrity of second and third frontal. Behind the insula, a focus of softening prolonged on the inferior temporal. In the right hemisphere, extensive softening occupying the inferior parietal lobe.

Remarks.—Again we have disturbance of speech and writing, with verbal blindness existing without other lesions than those of the sensorial centers, the frontal convolutions being unchanged.

CASE V.

Reporter.—Macewen (*Brit. Med. Jour.*, August 11, 1888).

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Melancholia and

homicidal tendencies, relieved by paroxysms of pain in the head. Psychical blindness for objects of all kinds. Verbal blindness.

Symptoms Relating to the Eyes.—None.

Result.—Relief from removal of the depressed bone.

Remarks.—Injury. Operation. Exposure of angular gyrus, when it was found that a portion of the inner table of skull had been detached and produced pressure on the posterior portion of the supra-marginal convolution, while a corner of it had penetrated and lay embedded in the anterior portion of the angular gyrus.

CASE VI.

Reporter.—Monakow (*Corresp. f. Schw. Aerzte*, 1889, No. 14).

General Paralytic Symptoms.—Right hemiparesis following apoplexy.

Affections of the Mental Faculties.—Total alexia and partial agraphia, but without aphasia. The patient could not read or copy, but could write spontaneously. He confounded letters (paragraphia). Disturbance of visual memory.

Symptoms Relating to the Eyes.—Right hemianopsia.

Result.—Death.

Autopsy.—Necrosis of the cortex of the posterior third of the interparietal fissure between the superior parietal and the angular gyrus. Beneath this necrotic part was found a cyst, the size of a nut, in the substance of the occipital lobe. Secondary degeneration of Gratiolet's fibers, as far as the internal capsule. The posterior cornu of the third ventricle was greatly dilated.

Remarks.—The author supposes that there are association fibers between the right occipital lobe and the center of sounds on the left side of the brain, and that visual impressions in general are perceived by both occipital lobes, but that the center of reading, memory of written and printed words, is found only on the left side, like the center of sounds and language.

CASE VII.

Reporter.—Hun (*Am. Jour. Med. Sciences*).

General Paralytic Symptoms.—Impairment of motion and sensation in right arm and leg.

Affections of the Mental Faculties.—Agraphia. Alexia. Aphasia.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Atrophy of lower three-quarters of the posterior central convolution and of the inferior parietal lobule of the left cerebral hemisphere.

Remarks.—Neither the alexia nor the agraphia was complete. The patient could read single letters and even short words with difficulty, but he could not spell the word with his eyes shut immediately after having read it. He could not store up the memory of the word he had just seen, although he could store up the memory of the same word when he heard it spoken.

CASE VIII.

Reporter.—Bateman. Cases 8 to 15 inclusive are from Starr (*op. cit.*).

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Agraphia. Alexia (?). Power to recognize objects impaired. Difficulty in speech, misplaced words.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Cyst and softening in left hemisphere affecting the inferior parietal, including the supra-marginal gyrus and the angular gyrus.

CASE IX.

Reporter.—Ball.

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Impaired power to recognize objects seen. Impaired reading power. Impaired power of writing. Speech affected, misplaced words. Difficulty in understanding speech.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Softening located in the inferior parietal, including the supra-marginal gyrus, and in the temporal gyri; left hemisphere.

CASE X.

Reporter.—Claus.

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Impairment of power to recognize objects seen. Alexia. (?). Agraphia.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Softening within temporo-occipital lobe ; left hemisphere.

CASE XI.

Reporter.—Amidon.

General Paralytic Symptoms.—None.

Affections of the Mental Faculties. Impairment of power to recognize objects seen. Alexia. Agraphia. Aphasia.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Softening involving the inferior parietal, the supra-marginal gyrus, the angular gyrus, the temporal gyri, and T-O lobe ; left hemisphere.

CASE XII.

Reporter.—Seppilli.

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Alexia (?) and Agraphia (?). Speech disturbed. Talked jargon.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Softening of entire T-O lobe of left hemisphere.

CASE XIII.

Reporter.—Monakow.

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Alexia. Loss of power to understand speech.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—With T-O lobe of left hemisphere.

(To be continued.)

BOOK REVIEWS.

BOOK ON THE PHYSICIAN HIMSELF, and things that concern his reputation and success. By D. W. CATHELL, M. D. New tenth edition (author's last revision). Thoroughly revised, enlarged, and rewritten. In one handsome royal octavo volume. 348 pages. Bound in extra cloth. Price, postpaid, \$2.00, net. Philadelphia: The F. A. Davis Co., publishers, 1231 Filbert Street.

That this book is popular with the profession is proven by the fact that this is the tenth edition; that it is deservedly so will be the verdict of all who read it. We know of no work from which the young physician can get so many hints of a kind which in his early days he particularly needs as the one under consideration, and the information is given in a most interesting and readable manner.

The author goes out of his way to slash at homeopathy, of which he evidently does not possess the slightest knowledge, but he says so many good things that we can forgive the affront and pity the ignorance which fathers it.

A MANUAL OF MEDICAL JURISPRUDENCE AND TOXICOLOGY. By HENRY C. CHAPMAN, M. D., Philadelphia: W. B. Saunders, 1892.

This little work of 237 pages, according to the preface, "embraces essentially the course of lectures on medical jurisprudence delivered by the author to the students of the Jefferson Medical College during the session of 1891 and 1892."

It is a concise, practical little work, covering a large amount of ground in a very small space and with great clearness, contains thirty-six plates, some of which are colored, and is printed with

clear type on good paper. It should be valuable to the beginner in this line of study.

ITEM.

There has been organized a National Society of Electro-Theraputists, the aim of which is to bring together all the various specialists who use electricity as an adjunct in therapeutics.†

There is a bureau devoted exclusively to the eye, ear, and throat. Applications for membership may be made to Dr. F. E. Caldwell, secretary, 151 Henry Street, Brooklyn, N. Y.

THE JOURNAL OF OPHTHALMOLOGY, OTOLOGY AND LARYNGOLOGY.

EDITOR,
CHARLES DEADY, M. D.

ASSOCIATE EDITORS,
H. H. CRIPPEN, M. D.
H. F. IVINS, M. D.

A UNIT OF MEASURE OF REFRACTION.

BY W. U. REYNOLDS, M. D., NEW YORK.

The writer has observed that the degrees of ametropia, and the lenses with which they are corrected, are all in proportion to distance, and the selection of glasses can be reduced to a system that is remarkable for its simplicity.

With a unit of refraction equaling the testing distance, the type of Dr. Snellen makes an ophthalmometer quite complete and accurate.

The unit should be that power of refraction possessed by a refracting medium having its focus at 20 feet, as that is the distance for which experience and theory have arranged the type.

This would be the strength of glass that would bring clear vision to a myope (?) having his most distant point of clear vision at 240 inches. A glass of 120 inches focus would have double the refracting power and be 2 units. One of 24 inches focus would have ten times the refracting power and be 10 units. Dividing the length of focus, in inches, into 240 will give the refracting power in units. Or we may say we have reduced the fractions $\frac{1}{40}$, $\frac{1}{30}$, etc., to fractions having the same or common denominator, that is, 240, the powers or units being the numerators.

In this way a series of numbers is obtained, that can be added, subtracted, etc., in whole numbers, the results being the power of refraction of the combination in units.

A myope having a vision of $\frac{1}{12}$, because his far point is only $\frac{1}{12}$ the testing distance, *i. e.*, 20 inches, should be relieved by a 12 unit glass, as that equals a focus of 20 inches. A myope having a far point of 16 inches would have a vision of $\frac{1}{16}$ because 16 inches is $\frac{1}{16}$ the testing distance. This represents the power of 15 units. A lens of that power at the eye should restore clear vision for distant objects, other complications excluded. A hyperope having need of a 10 unit, 24 inch, glass to relieve his accommodation for distant objects would have a vision of $\frac{1}{10}$.

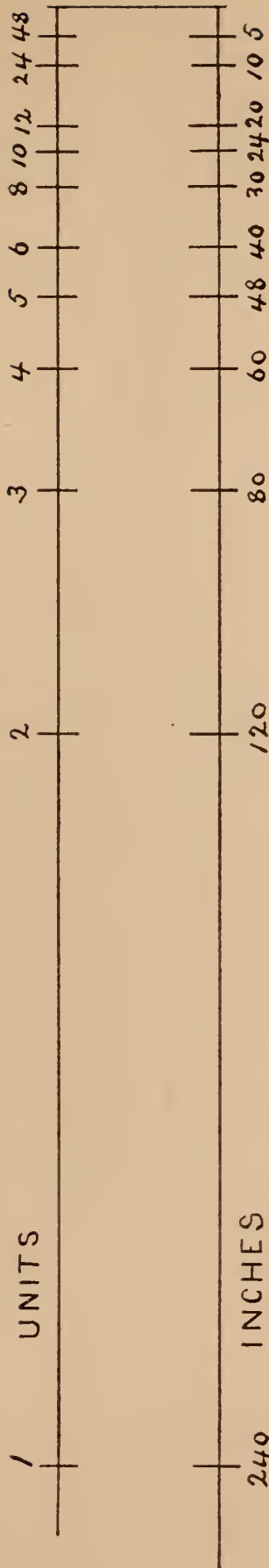
A person who, without accommodation entering into the case, reads without error and easily, the 100 foot line on the test card, should have $\frac{2.0}{100}$ vision myopia or hyperopia. This reduced to a fraction having 1 for a numerator, equals $\frac{1}{5}$ or a refractive power of 5 units, and is the difference between what he has and what he should have, and the far point, if myopia will be $\frac{1}{5}$ the distance from the eye to the types, or 48 inches. A —5 unit lens at the eye should restore the far point to practical infinity. If it is hyperopia, the far point will be minus and in imagination for demonstration only, 48 inches behind the eye. A plus lens of 5 units should make up this deficiency and relieve the accommodation.

The number of the line read, when divided by the testing distance, in this case 20 feet, the type being arranged for that distance, gives us at once a very close estimate of the degree of ametropia and indicates the glass to correct.

If the ametropia is great and the patient is moved nearer the type, say to ten feet, ($\frac{1}{2}$) or five feet, ($\frac{1}{4}$ of 20 feet) the strength of the glass will be twice or four times that indicated for the same line when read at 20 feet.

The experiments described by Dr. Loring on page 198 of his work on the ophthalmoscope would settle, that from the test type, light is constant in its direction. Convergent rays of light, divergent rays, and parallel rays successively thrown upon a printed page failed to change the refraction.

DIAGRAM N^o 1



Focal Lengths of Units

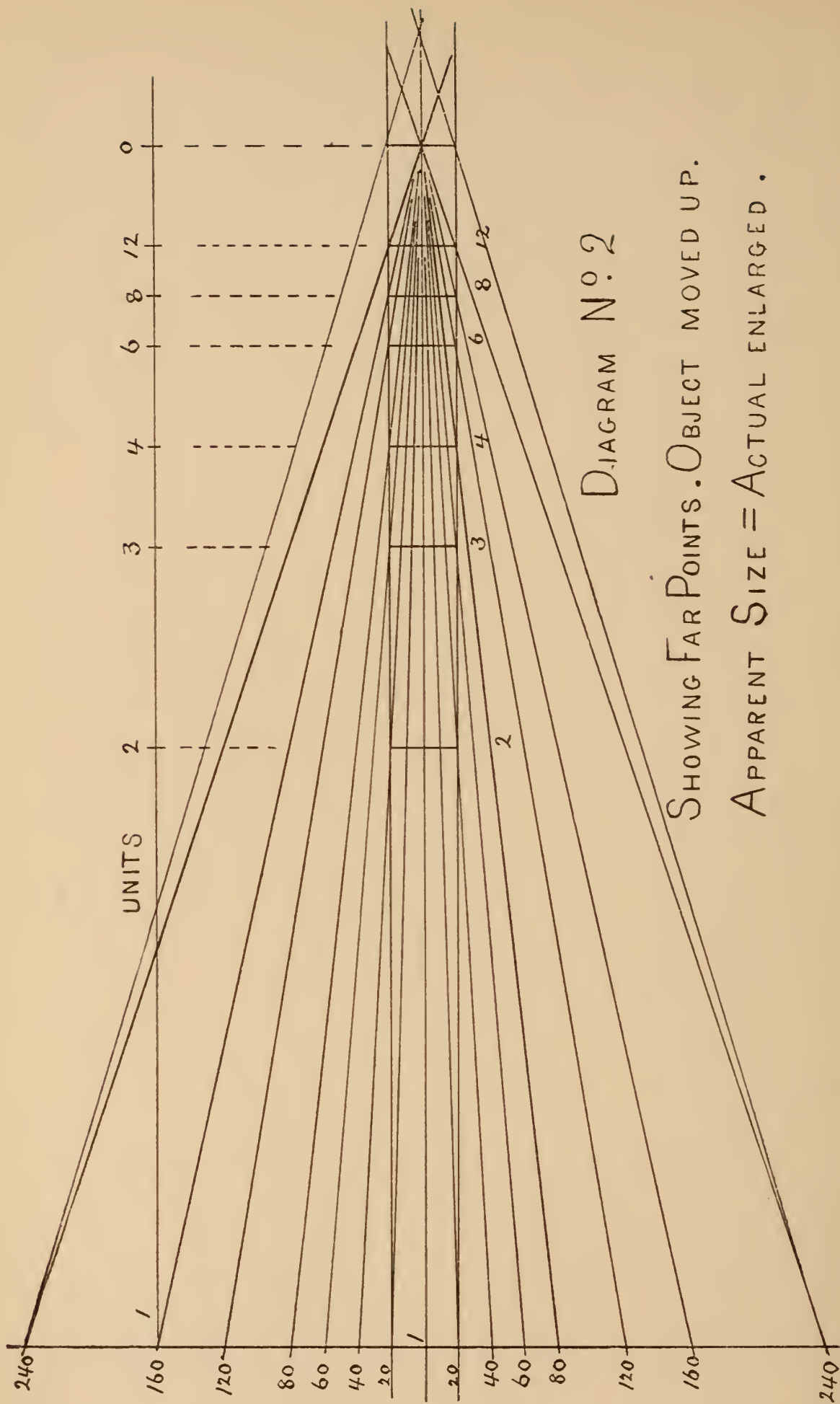


DIAGRAM N^o 2

SHOWING FAR POINTS. OBJECT MOVED UP.

APPARENT SIZE = ACTUAL ENLARGED.

That distance does influence the outlines, however, is well known.

To illustrate the position of the far point and compare the lengths of focus of the several powers of refraction, a few diagrams will be of service.

Diagram No. 1, representing the focal lengths of the units. Draw a straight line, and mark the center 2 and left hand end 1. At points measured from the right, mark 3, 4, 5, etc., one-third, one-quarter, one-fifth, etc., the length of the whole line. These represent the focal lengths of the several powers.

Diagram No. 2 representing the far points.

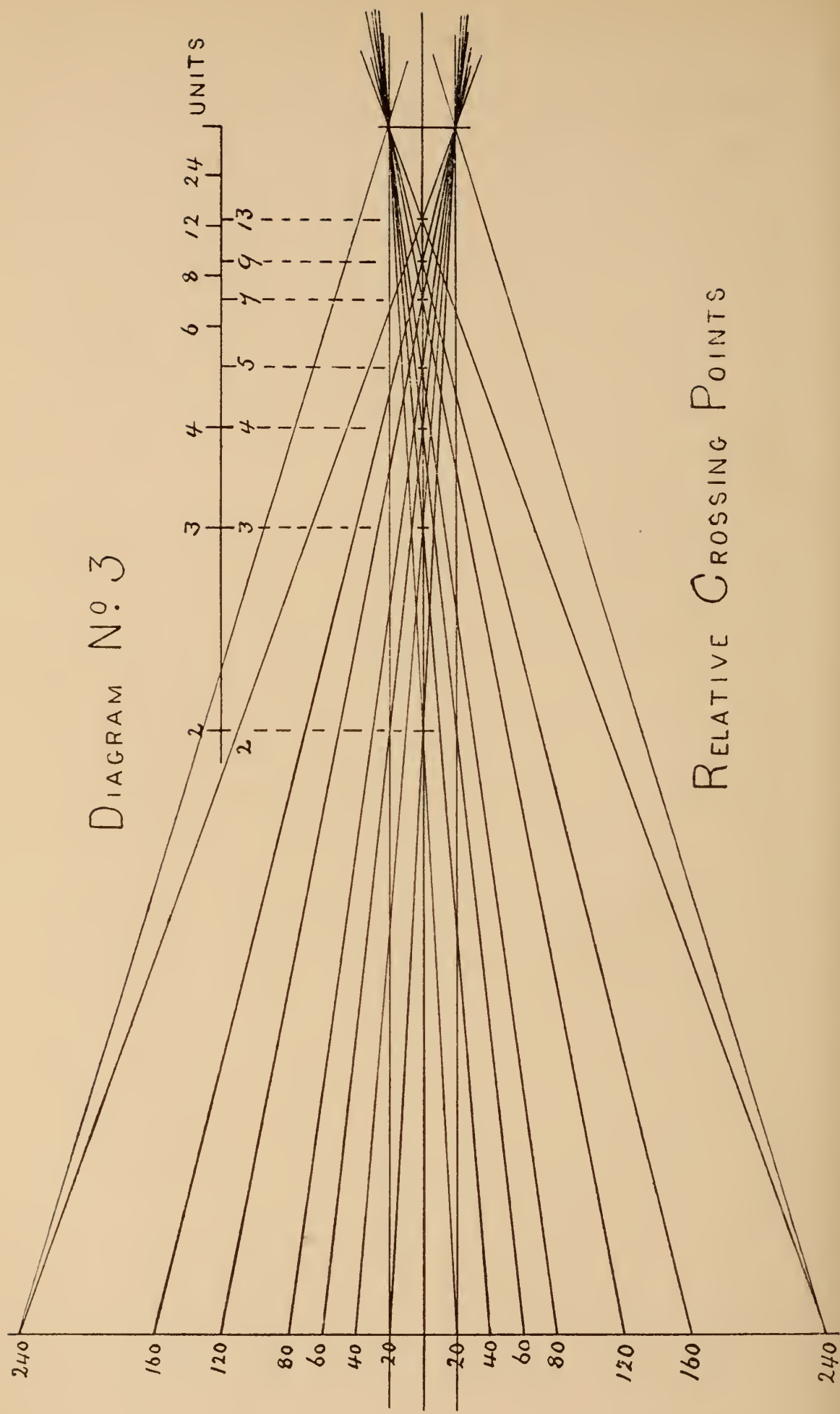
Lay off a straight line parallel to the horizon to represent the principal axis of the eye. Near the left end draw a line so that the principal axis is perpendicular to its center. On this line lay off equal spaces, both above and below the p. a. Number the points marking these spaces, both ways from the p. a., 20, 40, 60, etc., multiples of 20.

The distance from 40 to 40 will be twice that from 20 to 20. From 60 to 60 will be three times, and so on. The space 20-20 represents the size (enlarged) of the distinguishing spaces in the line on test types which should be read at 20 feet.

Make a point on the p. a. near its right end at a distance from the spaced line equaling the length of the line in diagram No. 1, to represent the nodal point of the eye. If you wish to be exact, make this point $\frac{7}{7680}$ of the whole line, further to the right. Draw lines from each numbered point in spaced line through the point on right. These lines are the limiting elements of the optical picture of our type spaces.

They may be extended to a line or curve representing the retina, an inch farther to the right, which distance, however, will be entirely disproportionate, as the exact place is $\frac{21}{7680}$ of the distance from nodal point to spaced line. Draw two lines parallel to the principal axis through the two points marked 20, to near the retina. Connect, by a line across the p. a., the corresponding intersections of the

DIAGRAM N^o 3



RELATIVE CROSSING POINTS

parallel and inclined lines, and mark these cross lines 2, 3, 4, etc. No. 1 being at the spaced line on the left.

These cross lines represent the space which should be seen at 20 feet, moved toward the eye to points where its boundaries are subtended by the lines limiting larger spaces at a greater distance. That is, its apparent size is a multiple of its apparent size at 20 feet. These multiples are the same as those on the spaced line on the left. Measured from the nodal point, the distances of these short lines are in the same proportion to the whole length of the principal axis, from nodal point, as the 20-20 space is to the other spaces on spaced line at left.

The apparent size and actual size are bases of triangles, similar because they have a common angle at the apex and their bases are parallel. Being similar their bases are in the same proportion as their altitudes.

Should we desire to compare the areas of the conical sections which these lines represent, we would find the same result, but we would have to compare the squares of the altitudes. If we call them hexagonal pyramids the sectional areas are also in proportion to the squares of the altitudes. The same position on the p. a. results in either case.

Lay off the principal axis and spaced line as in diagram No. 2, dividing and marking the spaced line 20, 40, and so on, and making the corresponding spaces the same length.

At the same distance as nodal point in diagram No. 2, or if you can, and wish to be exact, $\frac{7}{7680}$ of the distance from nodal point to spaced line nearer the spaced line, draw a short line across the principal axis and at right angles to it. On this line mark points equally distant from the p. a., and the same distance apart as the two 20 points on the spaced line at the left.

Connect each of the numbered points on the spaced line above the p. a., with the point on short line at right below the p. a. Connect each of the lower numbered points on spaced line with the upper point on short line. Connect the lowermost numbered point on spaced line with the

lower point on short line. Do the same with the corresponding uppermost two points. There must be the same number of spaces marked off on line at left, above the p. a., as below it.

Draw two parallels through the two 20 points, as in diagram No. 2, and connect the parallels by short lines at the points of the intersection of the diagonals with the p. a. Number these short lines, beginning at the left: 1 at the spaced line; 2 at the center, where the 20-20 lines cross; 3 where the 40-40 lines cross, and so on, with the number indicating the proportional distance on the p. a., which will not correspond with the numbers on the other diagrams in every case.

The short line at the right represents the size of a ray of parallel light coming from a distance of 20 feet, which would, being refracted or condensed, reach the retina between two points, and be perceived by a separation of those points. That is, it represents the smallest object the eye can distinguish by differentiating the outlines, and as it is light and parallel, it is the same size at one end as at the other. It is also the size of a ray, which will have no perceptible circles of blurring, in an average eye whose far point is infinity, or in one whose far point is 240 inches.

This crossing point varies with the refractive power of the eye. That is, with the size of the ray it is fitted to receive. And although actual change of distance is required to change the size of the ray, we can by increasing the actual size of an object and its distinguishing parts—that object remaining at a fixed distance—get the measure of the distance to which it should be moved. Every part of the picture gives its light, and it is the eye which determines the size of the ray.

The refractive power determines the point of crossing, and for clear vision it is at a point midway between the eye and object.

Let us borrow a term from geometry and call the cone or pyramid nearest the object the emergent “nappe,” and that nearest the lens the incident nappe.

Light also enters the eye directly as is illustrated by the elements running directly to the cross line at the right.

Intercept the light from above with a card behind the lens focusing an illuminated object upon a ground glass screen. The picture gradually darkens, mostly from the top; and we still have a picture even when the card has covered all but a small portion of the lens. Introducing the card nearer the screen at different points always produces the greatest darkening from the top, *i. e.*, in the direction of the movement, and the nearer the screen the greater the initial darkening. Obstruct the light close to the lens in front, and the darkening begins at top of picture. We have a perfect picture as long as any part of the lens is uncovered, but fainter the smaller the part. Close to the object the darkening begins and moves in opposition to the movement of card. A point is found where there is darkening from both directions at the same time. This is where the peripheral parts of the parallel rays cross for one of the lens's reflecting surfaces.

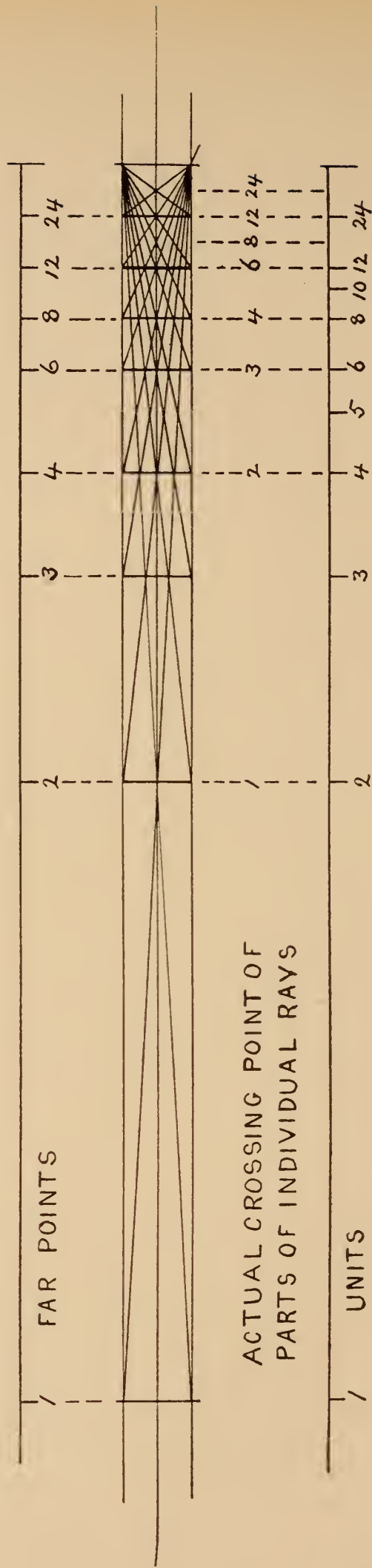
For smaller objects and parts of the same object the apices of the nappes will be farther from the lens, until getting down to the molecule of light at the proper distance, they will be halfway. Molecular focus and atomic focus are spoken of in explanation of the action of a lens. Whatever the distance of the object, these nappes will exist, and if the eye is accommodated for the distance of the object, or the lens has its screen at the appropriate distance, so that the slant of the limiting elements of the incident nappe coincide with the slant of the elements of the anterior conjugate focus, the picture will be clear.

This diagram, No. 3, however, only gives us a relative point, not the actual point.

Our object is to find the amount of refractive power necessary to bring the apex of this incident nappe, to a point where it will coincide with the apex of the incident nappe of an eye accommodated for an object at an infinite distance.

To do this we must add or deduct a certain amount of

DIAGRAM N^o 4



FAR POINTS AND UNITS COINCIDE
THE PARTS OF EACH RAY CROSS HALF WAY

power (or increase or decrease the size of the ray) equal to the difference between what the eye has and what it requires for viewing this distant object. This difference has been found to equal the strength of a lens of the focal length of the far point.

Our unit of measure is a focal length of 240 inches, of itself practically no power. We have found that part of a molecule of light is crossed by the action of the lens when going into it from a distance of 240 inches, and that it is crossed halfway or 120 inches. This crossing point bears an intimate relation to our unit of measure.

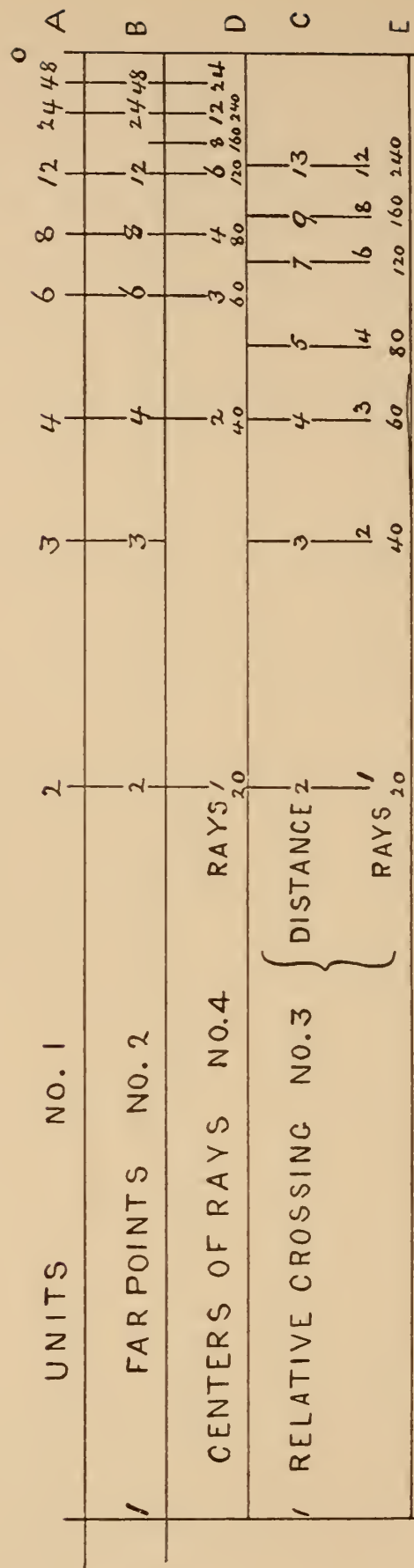
In order not to confuse, make a new diagram like No. 2, except to leave out the diagonals and spaced line at the left, except that part between the two 20 marks, and make a new line at the right like that in No. 3, putting in the cross lines at proper intervals, representing the unit of space moved up.

Make new diagonals by connecting each cross line, beginning with 20-20, with the new line at the right. The crossing points of these diagonals represent the crossing points when the object is at its far point, for the different kinds of eyes. Number the points 2, 3, etc., according to their ratio of position on the p. a.

Now let us compare our illustrative diagrams in a new diagram, No 5.

No 1 has figures and distances representing focal lengths and units of power. No. 2 shows an object stationary but increased in size to correspond with the original moved up. No. 3 shows the crossing points for the increase in size of an object remaining in its place. No. 4 shows the crossing point for an object moved along the principal axis without an increase in actual size. We have increased the amount of light proportional to twice, thrice, four times, etc., that at its original location, and the incident nappe still has its apex half way. The figures on Nos. 1 and 2 are the same for the same distances. Those on No. 3 are greater by one than the far point for the corresponding fraction of vision, not coinciding with the far point.

DIAGRAM NO 5



A.B.C. ARE PROPORTIONAL DISTANCES. D.E. FIGURES FROM SPACED LINE.

On No. 4 the points of crossing are one-half the distance of the far points.

We can now find our correcting lens in three ways. Thus, for $\frac{20}{20}$ vision = $\frac{1}{1}$. Far point 1 = unit 1.

Second. Relative crossing point 2; $2-1 = \text{unit } 1$.

Third. Actual crossing point 2; $2 \times \frac{1}{2} = \text{unit } 1$.

For $\frac{20}{60}$ vision = $\frac{1}{3}$. Far point 3 = unit 3.

Second. Relative crossing point 4; $4-1 = \text{unit } 3$.

Third. Actual crossing point 6; $6 \times \frac{1}{2} = \text{unit } 3$.

These proportions will be the same whatever the unit, but that unit must have a focal length of the testing distance.

With our test type we find the far point approximately, (we can find it in other ways, *e. g.*, objects brought close enough to be seen with clear outlines,) and measure the amount of blurring, which is in direct proportion to the ametropia, and it follows that the increase in size in the parts of objects necessary to overcome that blurring and separate the outlines of those parts, must also be in proportion.

The increase in apparent size is in direct proportion to the distance. We do not get clearer outlines except by increasing the size of the molecules of light or bases of the emergent nappes, by bringing the object actually nearer.

The line indicating the degree of ametropia must be read easily, without the slightest error.

The lines on test type can be numbered. Thus if they are to be used at 20 feet, the 200 line X, 100 line V, 70 line IV, etc., or new types can be made with the spaces multiples of the 20 space and the digits. But experience has shown that the variation in shape of the letters makes up for the irregularity in size.

If a length of 10 feet is used as a testing distance, these numbers can be doubled. Or simply divide the testing distance, in feet, into the number, in feet, expressing the distance at which the line should normally be read.

In numbering the lenses it is only necessary to mark on a strip of cardboard three columns of figures, one the inches

of focus, one the dioptries, and one the units, and lay the strip over the present numbers in the case of lenses.

Accommodation eliminated, hyperopia registers the same as myopia.

Knowing the glass, which should correct a case of simple refractive error, leads to the quick detection of other complications.

High degrees can be partially corrected and the difference combined. Combinations are made algebraically with especial regard to the minus and plus signs.

Without atropine, test with an over correcting glass in hyperopia, taking half the difference. Certain cases of myopia would be better tested with a plus glass in front of eye. And it would be better to have all patients look through a plus lens for some time before testing.

The numbers corresponding to the powers of lenses in general use are all simple.

The table on following page gives the focal lengths in inches and also of the dioptries the centimeters.

The writer has a wooden rod upon which is marked the units side by side with inches, centimeters, and dioptries. Upon this, slides having racks to hold lenses and screen of ground glass or paraffined paper, can be moved back and forth. Useful for testing glasses as well as comparison.

The addition of a unit of refracting power to a lens of high power does not change the length of focus much. Between 15 and 16 units there is a difference of one inch. Between 274 units ($.8759+$ inch) and 275 units there is a difference of $.00319$ inch in focal length. From this it might be inferred that different lengths of eyes required different proportional amounts of correction. Take a lens of 20 inches (12 units) and focus a small flame 20 feet distant. If the lens has been graded by parallel light, the screen upon which the focus is received will be farther off than 20 inches. Now place in front of this lens a $+6$ unit and a -5 unit lens ($+\frac{1}{40}$ and $-\frac{1}{48}$) and the screen will have to be moved to 20 inches. It was myopia with a far point at 20 feet and one unit would have corrected it. And

when we moved up the screen, the condition became emmetropia viewing with parallel rays.

Illuminate the test type and focus with a combination at 10 feet, of two 2 inch and one 7 inch lens (+274 units). Move back the screen until only the largest letter is distinguishable easily and a -20 unit clears up the outlines.

| UNITS AND FOCAL LENGTHS. | | | | DIOPTRES AND FOCAL LENGTHS. | | | | | |
|--------------------------|----------------------|--------------|----------------------|-----------------------------|--------------|------------|--------------|--------------|------------|
| <i>Unit.</i> | <i>Inches Focus.</i> | <i>Unit.</i> | <i>Inches Focus.</i> | <i>Diop.</i> | <i>C. M.</i> | <i>In.</i> | <i>Diop.</i> | <i>C. M.</i> | <i>In.</i> |
| 1 | 240. | 30 | 8. | .125 | 800. | 314.97 | 9.5 | 10.52 | 4.14 |
| 1 $\frac{2}{6}$ | 180. | 34 | 7.06 | .25 | 400. | 157.48 | 10. | 10. | 3.94 |
| 1 $\frac{3}{6}$ | 160. | 40 | 6. | .50 | 200. | 78.74 | 10.5 | 9.52 | 3.75 |
| 1 $\frac{4}{6}$ | 144. | 44 | 5.5 | .75 | 133.33 | 52.48 | 11. | 9.09 | 3.58 |
| 2 | 120. | 48 | 5. | 1. | 100. | 39.37 | 12. | 8.33 | 3.28 |
| 3 | 80. | 51 | 4.70 | 1.125 | 88.88 | 34.99 | 13. | 7.69 | 3.03 |
| 3 $\frac{2}{6}$ | 72. | 54 | 4.44 | 1.25 | 80. | 31.49 | 14. | 7.14 | 2.81 |
| 4 | 60. | 56 | 4.28 | 1.5 | 66.66 | 26.25 | 15. | 6.66 | 2.62 |
| 5 | 48. | 60 | 4. | 1.75 | 57.14 | 22.49 | 16. | 6.25 | 2.41 |
| 6 | 40. | 64 | 3.75 | 2. | 50. | 19.68 | 17. | 5.88 | 2.31 |
| 6 $\frac{4}{6}$ | 36. | 68 | 3.53 | 2.25 | 44.44 | 17.49 | 18. | 5.55 | 2.18 |
| 7 | 34.28 | 74 | 3.24 | 2.5 | 40. | 15.75 | 20. | 5. | 1.97 |
| 8 | 30. | 80 | 3. | 2.75 | 36.36 | 14.31 | 40. | 2.5 | .98 |
| 9 | 26.66 | 88 | 2.73 | 3. | 33.33 | 13.12 | 45. | 2.222 | .8748 |
| 10 | 24. | 96 | 2.5 | 3.25 | 30.77 | 12.11 | | | |
| 11 | 21.82 | 108 | 2.22 | 3.5 | 28.57 | 11.25 | | | |
| 12 | 20. | 120 | 2. | 4. | 25. | 9.84 | | | |
| 13 | 18.46 | 240 | 1. | 4.5 | 22.22 | 8.75 | | | |
| 14 | 17.14 | | | 5. | 20. | 7.87 | | | |
| 15 | 16. | 274 | .8759 | 5.5 | 18.18 | 7.16 | | | |
| 16 | 15. | | | 6. | 16.67 | 6.56 | | | |
| 17 | 14.5 | | | 6.5 | 15.38 | 6.06 | | | |
| 18 | 13.33 | | | 7. | 14.28 | 5.62 | | | |
| 20 | 12. | | | 7.5 | 13.33 | 5.25 | | | |
| 22 | 10.91 | | | 8. | 12.5 | 4.92 | | | |
| 24 | 10. | | | 8.5 | 11.76 | 4.63 | | | |
| 27 | 8.88 | | | 9. | 11.11 | 4.37 | | | |

Tried with several other lines the lens indicated by the fraction of vision cleared up the picture each time.

There are several experiments which can be tried with the rod and racks which will give new ideas in regard to the action of a lens and the size of ray, picture, etc.

The change in focus is due to the action of the lens itself. At the point where the picture of anterior surface meets

the picture of posterior surface will be the focus, and this position changes with the distance and size of ray.

It is said of the test type that some letters were more easily distinguished than others, and the spaces were irregular.

The writer has an arrangement by which two lines can be approximated or separated with mathematical precision to correspond with the different multiples of a standard (Dr. Smellen's).

The interval can be white, red, or green at will. As is well known, color perception varies and can, in some abnormal cases, be corrected with lenses.

The use of the unit in determining the glass for presbyopia is shown in a few words. Have a rod or tape upon which the units are marked, with inches also. At the one inch mark will be 240 units, at the twenty inch mark 12 units, etc. With this get the distance of comfortable, clear vision in units. This number, deducted from the units of the distance to which correction is to be made (10 in., 24 units, or 12 in., 20 units), gives the number of units to correct. Thus, for a person reading easily at 24 inches, the first number obtained is 10 units; this, deducted from 20 units, if the distance required is 12 inches, gives 10 units of refraction as the amount to be supplied, and this is a 24 inch glass. Had the correction been to 10 inches the correcting glass would have been 14 units, which equals a 17 inch glass. This not being in the case of test lenses we would have to select between a 16 inch and an 18 inch plus glass.

The glass to relieve a presbyopia does not equal in focus the distance of clear, comfortable vision, but is equal to the difference between a lens of that focus and a lens of a focal length equaling the distance to which the correction is made.

Our first example is misleading unless the principles involved are carefully considered.

Of course, all selections are only preliminary to the care-

ful proving which must be made before a prescription is written.

In selecting for near vision the diopters can be used in the same way as the unit, marking them on a tape or rod, and making the corresponding deduction to get the difference in power of refraction between the two points, both being measured from the eye.

The writer is indebted for suggestions and instruction received at the New York Ophthalmic Hospital, and does not claim originality. While he has satisfied himself, the matter is yet to have a thorough practical demonstration.

The following and other works have been consulted :

The Refraction and Accommodation of the Eye. E. Landolt, M. D. C. M. Culver, M. A., M. D., 1886.

Text-Book of Ophthalmology. Dr. Ernest Fuchs. A. Duane, M. D., 1893.

Optical Projection. Lewis Wright, 1891.

Light. Lewis Wright, 1892.

The Refraction of the Eye. G. Hartridge, F. R. C. S., 1892.

Optics. D. Lardner, 1878.

A Treatise on Optics. E. Nugent, C. E., 1868.

Physical Optics. R. T. Glazebrook, M. A., F. R. S., 1886.

Geometry. S. T. Stewart, 1891.

Text-Book of Ophthalmoscopy. E. G. Loring, M. D., 1886.

Defects of Vision. R. B. Carter, F. R. C. S., 1877.

Diseases of the Eye. E. Meyer. Fergus, 1887.

A CASE OF ENCEPHALOID CARCINOMA OF THE PHARYNX AND ŒSOPHAGUS.

BY CHARLES E. JONES, A. M., M. D., ALBANY, N. Y.

My sole excuse for submitting for publication this case from an old notebook, is its extreme rarity :

On the 23d of September, 1880, I was called to see Miss B., a resident of New Scotland, Albany Co. She was twenty-eight years old, a brunette, very intelligent, sanguine temperament, and of 5 feet 2 inches stature, comely in appearance, and in health had weighed 130 pounds. Had, with the exception of an attack of typhoid fever in her sixteenth year, always enjoyed good health previous to her present illness. None of her family had suffered from tuberculosis. Her father, then living and in good health, had lost two brothers by what had been supposed to be cancer of the stomach ; although no autopsy had been held in either case to confirm the diagnosis.

From the statements of herself and friends, the history of her present sickness may be collated as follows: While visiting her sister at Walla Walla, Wash., in February, 1880, she contracted a severe cold, which seemed to produce no other symptoms than those usual in acute catarrhal pharyngitis and laryngitis. The angina was treated by painting the pharynx with perchloride of iron. Notwithstanding this treatment, the acute symptoms lapsed into those of a subacute nature. About the 1st of April, by means of her hand-mirror, she noticed in the center of the pharynx, at a point about opposite the uvula, a small round tumor of the size of a pea, and pink in color. She called the attention of her physician to it, who, on examining it with the finger, found it of soft consistency, and pronounced it, as she said, a fungous growth. He treated the excrescence by penciling with nitrate of silver.

This growth continued to extend, gradually impeding deglutition, until on the 17th of May she ceased taking solid food. Early in June the lymphatic glands below the left angle of the jaw began to swell, and rapidly enlarged. In July the glands beneath the lobule of the right ear increased quickly in size.

On the 6th of July she left Walla Walla for Albany, arriving at San Francisco *en route*, she had her first severe hemorrhage, though she had occasionally expectorated small quantities of blood before. She arrived home about the 1st of August. Such is the history of the case when I was called. She was then extremely emaciated, and suffered from great dysphagia, though there was no odynphagia. Her voice was weak, but clear and distinct. Her family told me that they had observed no hoarseness, and to them the only change in her voice seemed to be that it was pitched in a higher key than natural. The sputa consisted of frothy mucus, and her breath had no unpleasant odor.

A laryngoscopic examination showed a serpiginous ulcer covered with a grayish exudate, pursuing an oblique course toward the left, apparently involving the aryepiglottic fold. The ventricular bands were greatly swollen, so covering the vocal cords that their free margins only were discernible. So far as could be seen they appeared to be perfectly healthy. The epiglottis was twisted upon itself, and during the act of deglutition did not cover the glottis. My diagnosis was encephaloid cancer of the pharynx and œsophagus. The primary seat being the pharynx and extending to the gullet by infiltration. As to treatment my only recourse was to ameliorate her distress until the inevitable lethal issue. She had been mainly sustained by nutrient enemata for some time previous to my visit; so I directed their continuance. To relieve the agonizing sensation of "goneness" in the stomach, of which she complained, I prescribed 15 minims of 2d decimal dilution of arsenicum alb. in 4 oz. of water; two teaspoonfuls to be taken every two hours. The administration of this remedy was attended with favorable results, for on my second visit, the 3d of October, she expressed great relief from this symptom.

Her condition at this time was about the same as before, except that the laryngoscope demonstrated that the diseased mass and collateral swelling had increased so much that a view of the vocal cords was rendered impossible. The dysphagia had, of course, increased. I saw her again on the 19th of October. She had

gradually grown weaker. Had suffered several slight hemorrhages, and at times her breath had been fetid. Did not attempt a laryngoscopical examination. Dysphagia had increased to so alarming an extent that even fluids were regurgitated ; though now and then she could swallow water. The rectum was becoming intolerant of the enemata, they being often ejected. As a singular fact, I may mention that she vomited an enema of milk, which had been quite forcibly injected. Her friends were positive in asserting that she had taken none *per ora*. Intellect was clear, and voice so strong that she could be heard distinctly across the room. She had such difficulty in swallowing that I discontinued all medicine.

On the 2d of November I was informed of her death, and the following day made a *post-mortem* examination. The consecutive and contributing cause of death was inanition. Such extreme emaciation I have never seen.

On making a longitudinal incision from the symphysis of the chin to the upper border of the sternum, the superficial muscles of the neck presented that anæmic and flaccid condition characteristic of death from marasmus. On the left side of the trachea cancerous infiltration had separated the *faciæ* of the various muscles, displacing them, and, in some instances, involving their substance. The malignant mass extending to the deep layer of cervical glands of the left side had involved the external and internal carotid arteries reaching down as far as the bifurcation of the common carotid. The jugular vein was also encased in the diseased tissue. The upper and middle thirds of the œsophagus were completely infiltrated with cancerous *débris*. The origin appeared to have been at a point directly behind the uvula, and then extending down the lateral pharyngeal walls, implicating the glosso-epiglottic folds, almost obliterating the *sini pyriformi*, so on into the œsophagus, nearly rendering the upper half impervious. The base of the tongue at its attachment to the epiglottis showed slight signs of infiltration, but the *valleculæ* and the epiglottic half of the glosso-epiglottic ligaments were free from disease. On opening the larynx and trachea they were found healthy, excepting a little collateral congestion, and very slight

infiltration of the left tracheal wall. The other organs of the body were free from disease. The larynx, trachea, and œsophagus were preserved. Several sections were made, and microscopic examinations made by both Professor Hailes, pathologist of the Albany Medical College, and myself. We agreed that the growth was one of undoubted encephaloid carcinoma. The stroma in most of the sections was very deficient, and the large cells differentiating it from scirrhus very abundant. However, there were a few sections that exhibited a denser stroma with smaller cells, thus demonstrating the close relationship existing between the medullary and scirrroid forms of cancer. Purcell, "Cancer and its Treatment," Philadelphia, 1881, says: "Soft carcinoma and scirrroid carcinoma cannot be regarded as in any way distinct forms of cancer. There are all intermediate stages between them, and the differences in the rapidity of their growth, and consequently in their structure and physical characters, constitute their only distinctive features. The epithelial growth in soft carcinoma is rapid and abundant; and the cells, for the most part, larger than in scirrhus; quickly undergoing fatty degeneration, so often more free nuclei than cells are visible. The proportion of stroma is very small, and owing to the rapidity of its growth it is much less fibrous than that of scirrhus, and does not undergo a similar contraction." Delafield and Prudden "Handbook of Pathological Anatomy," New York, 1892: "If the stroma is abundant, and dense, and preponderates over the cellular elements, the tumor is usually hard, and is called scirrhus or fibro-carcinoma. If, on the other hand, the cellular elements largely preponderate, the tumor is usually soft; and, if it do not contain too many blood vessels, may have a general resemblance to brain tissue, and is then called encephaloid or medullary; or better, carcinoma molle. These are the most malignant of the carcinomata."

The microscope thus substantiated the diagnosis, which was based upon the age of the patient and the rapid growth and dissemination of the tumor.

The above case is unique in the following particulars.

1st. This variety occurring in this situation. The original site of the disease being indubitably in the pharynx. Now, with the exception of Cohen, all authorities agree that encephaloid disease is exceedingly rare in this location. McKenzie states that the disease in the pharyngo-oral cavity is usually scirrhus.

Of the six cases collected by myself three were epithelioma and three scirrhus. Petri and Zenker do not give the varieties of fifty-three cases, as Zenker believes that all cancers of the pharynx and esophagus are flat celled epitheliomas; an assertion which I do not think is tenable. Cornil and Ranvier say, "Carcinoma very rarely exists as a primary tumor of the pharynx. In the œsophagus we do not believe that it ever originates as a primary growth. It invades the œsophagus by extension from adjoining parts, such as the lymph glands, cellular tissue of the mediastinum," etc.

2d. The walls of the pharynx were not adherent to the cervical vertebræ. Dr. Charles E. Squarry in "Reynolds System of Medicine," says: "A cancer may arise from the walls of the pharynx; it is then generally epithelial, but it is more frequently connected with the vertebræ and grows forward, forms a tumor at last eating its way into the pharynx." Rokitanskey affirms that the œsophagus soon becomes fixed to the vertebral column by adhesion of the diseased mass. In this case the œsophagus could be easily removed from its bony support.

3d. The occurrence at so early an age—Dr. George Pollock, "Holmes System of Surgery," gives his opinion that "Cancerous ulceration is a disease of advanced age. We are not aware of its occurrence in youth or early life." In opposition to this Rokitanskey may be cited as saying that medullary cancer is the most common form in the earlier periods of life, and has even been observed in the fœtus; but it must be remembered that since his day many of the cases thought to be encephaloid have by recent investigations proved to be round cell sarcomata. Of Petri's thirty-

eight cases, three were under sixteen ; of Zenker's fifteen cases, none were under thirty.

4th. The larynx was not involved. It will be remembered that no laryngeal symptoms were present. It is strange that there was no aphonia or dysphonia when we remember how extremely liable the recurrent nerve was to be affected by the excessive infiltration of the cellular tissue and muscles of the neck.

5th. Many other symptoms were wanting that would under the circumstances be expected. The almost entire absence of the usual fetid odor so pathognomonic of cancer, the freedom from lancinating and burning pain which are almost always present. The most careful questioning failed to elicit a history of pain. Also there was no odynphagia. This would not have been singular had the primary location of the growth been in the pharyngo-laryngeal cavity, but in the higher situation the lack of pain in swallowing was indeed remarkable. Another point : It seemed to me peculiar considering the extent of the disease, that the pneumogastric nerves were not affected, but there was no pain or paralysis in the domain of these nerves.

As a matter of clinical import, the diagnosis aside from the microscopic proof was sustained by the non-existence of metastasis which is acknowledged by the most competent authorities to be less liable in this variety of cancer than in any of the others. In epithelioma the extension is more superficial than with the medullary form which penetrates the tissues more deeply and is therefore more rapidly fatal. As long ago as '46 Rokitanskey said that medullary cancer both in its development and in its subsequent course was the most acute of all carcinomas, and so it proved in my case.

SOUND AS A THERAPEUTIC AGENT FOR DEAFNESS.*

BY E. J. BISSELL, M. D., ROCHESTER, N. Y.

Special therapeutic aid approaches perfection when it is most in harmony with the natural workings of any particular organ or part. This being a therapeutic principle quite well established, we might, by simple deductive reasoning, without experimentation, conclude that the human ear, made, as it is, to receive and transmit a peculiar form of vibrating motion, could under certain conditions, when deranged, be improved by bringing to it properly regulated sonorous vibrations.

All sensations received at the brain are probably the correlation of molecular motion along the nerves; be this as it may, it is certain that the auditory apparatus is especially constructed for receiving, from the outer world, vibrations of varying rapidity and intensity, and that finally the brain translates them into sound. Sound is to the ear what light is to the eye. Both being a form of wavelike motion and both having defined limits in the rate of these vibrations. Sound has a range of over eleven octaves, or from sixteen to thirty-eight thousand vibrations a second, while light has less than one octave, but the waves producing it vibrate at the tremendous rate of from three hundred and ninety-five billions to seven hundred and sixty-three billions a second, the lower rate producing extreme red and the higher extreme violet.

Let us now in a practical way consider sound as a thera-

* Homeopathic Medical Society, State of New York, February, 1893.

peutic agent in that form of deafness known as chronic catarrhal.

It is not necessary for the purposes of this paper to enter deeply into the pathology of this disease, which, more commonly than any other, impairs the hearing and causes that distressing condition called tinnitus, or noises in the ear. Briefly stated the middle ear is the part chiefly involved. There is hypertrophy or atrophy of the mucous or sub-mucous tissues. The tympanic membrane is displaced, generally retracted; there is more or less stiffness at the joints of the three little ossicles, quite similar to false ankylosis; the middle ear cavity may contain dried mucus; often the eustachian tube does not permit of proper ventilation or maintain an equilibrium of atmospheric pressure within the tympanic cavity. In substance the middle ear stands as a barrier to the perfect transmission of the softest, sweetest, and pleasantest vibrations which nature intended should reach the human brain. The therapeutic need seems quite plain. In connection with proper treatment for the nose, throat, and eustachian tube an effort should be made to secure freedom of motion to parts which nature intended should move freely. To accomplish this end power, motion, vibration, is necessary. For years efforts in this line have been made, but they were too mechanically rude, when you consider that the normal tympanic membrane is capable of vibrating thirty-eight thousand times a second. Forcibly moving the drum by pressing against it or by condensing or exhausting the air in the external meatus are too coarse measures for most cases. What could be more in harmony with nature than to furnish the necessary power as sound, the wavelike motion peculiarly adapted to the ear?

During the past year a number of experimenters have been working along this line with remarkable success. I make this prediction, that in the evolution of this principle aural therapeutics will accomplish what a few years ago was considered impossible.

To thoroughly understand the work to be done and how

to do it, it is necessary to have before us a few scientific facts.

First—The human ear is capable of receiving and developing into sound, vibrations ranging from 16 to 38,000 a second, *i. e.*, about 11 octaves.

Second—Out of this number only vibrations of from 40 to 5000 are strictly musical and are employed as such. This is a little over 7 octaves.

Third—In ordinary conversation the male voice has an average range from 93 to 140 vibrations a second, and the female voice from 280 to 560. This shows the lowest vibration of the female voice to be one octave above the highest of the male.

With these facts before us, and if there is anything in this new method of treatment, I think it is good reasoning to say that if we wish to develop the full range of vibrations in an ear, which has less than the normal range, or which cannot transmit vibrations of any given number unless they are of great intensity *i. e.*, loudness, we must have an instrument which can bring to the ear at least a range of vibrations sufficient to include those of the human voice, both in music and ordinary conversation, and in all probability it should have a much greater range than this; and the intensity of these vibrations must be of such a degree, and so regulated, as to overcome rigidity and secure a corresponding vibratory motion in the parts which it is intended to effect.

It therefore follows that of the three properties of sound,—pitch, intensity, and quality,—pitch and intensity are of paramount importance, and the quality of the sound is of secondary consideration. Some, I am aware, have taken largely the quality of the sound into consideration, and to carry out this idea have used from a tin pan to a fish horn. If they have secured good results from these various things, I am still inclined to believe that it was not because of the quality of the sound, but because in this way they secured either a different pitch or intensity. However, if there is much importance to be attached to this third property of

sound, Dr. Houghton, who was a pioneer in this new field of research, has the best thing in the new reed instrument which he has constructed. But it must be kept in mind that a fundamental note is the same in all instruments, and the quality of the sound simply depends upon the power to develop the harmonic or overtones. The organ of voice is a most perfect reed instrument, and it is possibly for this reason that Dr. Houghton uses a similar kind of instrument.

I have had constructed and have used in my practice for several months an instrument which, while it may not be perfect, most wonderfully fulfills the essential features which I have outlined above.

The points I make for the instrument are as follows :

1. A range from fifty to eight thousand vibrations a second. All intervening vibrations are readily secured by bringing to my aid the four ways in which pitch can be produced, in string instruments *i. e.*, by the length, the tension, the size, and the density of the strings.

2. The intensity of sound is secured by a good sounding board ; a large and tapering tube extending from the sounding board to the patient's ears ; and a firm, compact and easily regulated adjusting apparatus by means of which the degree of contact of the revolving wheel with the vibrating string is maintained. The conducting tube is so constructed that the sound can be transmitted into one or both ears.

3. The revolving wheel is surrounded by a thick band of rubber into which is fixed a tortoise shell point, this arrangement develops the best quality of tone. The wheel is turned by an electric motor connected with the Edison current. A high rate of speed can thus be employed when desired. The motor is so arranged that no sound from it can be communicated to the sounding board.

Conclusions.—This method of treatment improves the hearing and stops tinnitus by directly increasing the mobility of the ear drum and ossicles and indirectly by improving the circulation and nutrition of the parts about the middle ear.

In from three to ten minutes the patient complains of heat or itching within the ear, and on ocular inspection it can be seen that the circulation has been augmented. When these sensations manifest themselves it is an indication that the treatment has been employed sufficiently long at that sitting.

Since the ear-drum is a membrane, more or less stretched, it has a pitch peculiar to itself. I believe, therefore, that when we transmit a vibration into the ear corresponding to the length of vibration peculiar to the drum we secure the most powerful effect.

Patients who hear better in a noise, as on the cars, improve more rapidly than those of whom the reverse is true. If the internal ear is involved the treatment should not be used.

In the class of cases in which this method is indicated I have not have had a case under treatment that gave entirely negative results. In some the improvement has been wonderful. No unpleasant reaction has followed in any case in my practice.

We are yet in the beginning of this great subject. There are many points still unsettled.

DISCUSSION OF DR. BISSELL'S PAPER.

BY HENRY C. HOUGHTON, M. D., NEW YORK.

Before commenting on Dr. Bissell's paper, allow these preliminary words :

After studying aural therapeutics twenty-five years, I find myself less dogmatic about sound than at the beginning ; then I knew sound consisted of air-waves, because the text-book said it ; now I doubt not only that assertion of the teachers, but many more, since I have studied sound as a therapeutic agent in the treatment of aural disease. I am ready to hear all that any student in this field has to say, and wait for light, as well as sound.

I believe sound is an essential force, like heat, light, electricity, magnetism, latent under ordinary conditions, manifested by any sonorous body, when set in motion ; it is possible that force is the unit, and sound simply a correlation ; because muscular force is changed to vibrations, manifest as music ; the same is true of other force forms. Sound is conveyed by air, water, wood, glass, iron, steel ; but when we come to molecular motion, wave theory, etc., and ask as to the how, demonstration often fails.

Since sound has been used as a means of aural massage, much study and experiment have been bestowed upon the various instruments that produce sound. Drs. Maloney, Garey, Wilson, Buffum, Hooker, all report the same effects and results. The immediate effect, heat ; the remote result, increased mobility ; so it is a question of method, of instrumentation.

Granted the principle, next the mode of applying it.

Maloney showed that massage could be produced with his modification of the conversation tube. Garey demonstrated that the same could be done by the phonograph and stethoscope. Berliner by the telephone. G. H. Wilson by the guitar; the principle is capable of multiple methods of application.

My first studies were made with Maloney's instrument, and I agree with the conclusions reached by Dr. King, of Washington, D. C. My next trial was with the phonograph, as suggested by Dr. Garey. This is very effective in producing single concussions of the auditory apparatus, slowly or rapidly, and it brings about very remarkable changes in audition. Cylinders may be used to produce regular tones, or single musical vibrations of varying pitch, to meet the needs of high or low subjective tones. My next experiment was with a reed chest of a Mason & Hamlin organ, with similar results. When Dr. Garey brought out his vibrometer, I procured one, and obtained the same general results. During the past two months I have been experimenting with composite sounds, noise with tones, the sounds of blows produced by the phonograph, joined with musical tones of slow pitch, and lastly, for the past month, with chords of major or minor notation and full harmonies from a reed organ.

As a result of all my study, I agree with the conclusions reached by those interested in the new departures, and have read Dr. Bissell's paper with great interest. The instrument, judging from the description alone, is much like that of Dr. G. H. Wilson, of Meriden, Conn., with some unique features calculated to make it very effective.

I agree with conclusions stated as to the effects produced. I am compelled to make an exception to this statement: "Since the ear-drum is a membrane more or less stretched, it has a pitch peculiar to itself." The drum-head is on trial just now; theories are being reconstructed; it may be that the drum-head moves as a whole, one can see it move by using Valsalva's experiment, but it does not thus move in the act of hearing. I would rather say the

drum-head is the medium of conveying unnumbered vibrations, and under peculiar conditions, at the same instant, as, for instance, listening to an oratorio, the grandest combination of orchestra, organ, and human voices, numbering hundreds. Bettini, the inventor of the micro-phonograph, claims that the drum-head vibrates not as a whole, but at nodal points, and these vibrations are conveyed as molecular disturbances through the ossicula, and at the same moment through the contained air of the tympanum.

So we must not allow our minds to dwell too closely on the function of the ossicula. I believe that the entire mucosa of the tympanum must be, and is involved in the transmission of vibrations concentrated in the meatus auditorius externus, and as its nutrition is modified, the function is improved.

I am sorry to say that my experience in treating those who hear better in a noise—those with whom I can converse while they are using the phonograph or vibrometer—has been very tedious, and devoid of satisfactory results, but recent cases of catarrhal disease give brilliant results.

Regarding the internal ear, I will agree with the writer, if he means acute involvement, but not in hyperæsthesia or torpor. Now that Charcot is using a vibrometer for disease of the brain and nerves, I hope we may find added reasons for massage.

I find that forcible treatment produces vertigo, great confusion of the head, and, in some sensitive cases, a weary, tired brain. In most cases this passes off in an hour; in some it persists during the day. After an hour the hearing improves, the head is clearer, and in many cases the secretions of the entire mucous membrane of the head are affected. In some cases the general treatment with the phonograph or vibrometer increases the confusion, changing the pitch from low tones to high tones, or to a single high tone; then the use of tone nearest to the subjective will dispose of that. In one case of partial paralysis from cerebral apoplexy or exudation, the treatment not only relieved the subjective noise at each sitting, but had the effect to quiet the entire

nervous system. Whether this were through the mental relief from the subjective sound or otherwise, I am not able to determine.

I have had varying results in cases of tinnitus, due to some condition other than lesion of the middle ear. In some cases the tinnitus has been entirely dispelled immediately upon the treatment, and has not returned after one sitting. In other cases it has been abolished by a few treatments, while in still other cases the treatment made no impression whatsoever, either at the time or afterward.

As regards unpleasant reaction, I did obtain some in my own person as the result of too vigorous and prolonged experimentation; I brought about an extremely sore, sensitive condition of the tympana and neuralgia reaching over the entire branchings of the trifacial, specially into the teeth. I have produced soreness of the scalp in patients, and neuralgia of the trifacial, similar to that which I experienced; and in a number of instances the treatment was associated with a most remarkable increase of secretion from the entire naso-pharyngeal mucous membrane, which was attributed by the patients to the treatment, and as nothing of the kind had occurred in months or years, I felt inclined to agree with them. I have had no disastrous results follow from the treatment, but am inclined to the opinion that excessive massage is capable of producing the same effects upon the ear, as excessive massage would produce upon any other part of the body.

I conclude with the expression of my deepened conviction that aural massage has come to stay, and it behooves every one of us to study it thoroughly that the profession and the world may have the benefit of our combined efforts.

A CASE OF OCULAR TRAUMATISM.

BY E. W. BRICKLEY, M. D., YORK, PA.

Every ophthalmologist, unbiased in judgment, will admit the fact that eyes badly injured are many times doomed to enucleation when a conservative course of treatment under the constant watching of a competent attendant would, in some instances, result in the possession or restoration of at least a partial degree of vision.

Do not understand me as advocating a palliative and expectant course in those cases where the ciliary region has been undoubtedly injured beyond repair, or where a threatened panophthalmitis endangers both eye and life; but there is a happy "golden mean" along which one is often, it may be unconsciously, guided, productive of gratifying results.

Such an experience has led me to report the following case which came under my notice during the summer just past.

John H., age fifty years, a carpenter in the employ of the P. R. R., consulted me on the evening of June 28, 1892, giving the subjoined history:

He, with a fellow-workman, was engaged in cutting a cast-iron sewer pipe into sections, using for the purpose a sledge and chisel, the patient wielding the former in a standing position, and while striking the chisel a piece of iron struck him in the left eye, blinding him instantly.

The injured optic was shortly after seen by the company surgeon, who applied a simple muslin roller with a pad of borated cotton, with the remark that "it would come all right"; but

the pain becoming so excruciating, the patient consulted me for relief. Upon inspection I found a laceration about the center of the superior lid, extending from the edge upward four or five lines, the palpebral conjunctiva being penetrated.

A ragged wound in the cornea close to the sclero-corneal junction and at the upper and inner quadrant had allowed an extensive prolapse of the iris which hung in shreds from the opening.

The anterior chamber, partly filled with blood, precluded a very satisfactory examination of the deep structures, but an extensive irido-dialysis for fully one-half of the periphery was plainly visible, and the marked ballooning of the iris spoke eloquently of a swollen and cataractous lens. Naturally suspecting the lodgment of a foreign body, and considering the eye to be irreparably damaged, I advised immediate extirpation, which was as promptly and emphatically refused.

At his earnest solicitation to save the globe if nothing could be done for the sight of it, I, after stating the probable gloomy outcome, consented to try; faintly hoping that possibly the bit of iron might have passed out after inflicting the damage.

A number of instillations of cocaine 10 per cent. in 1-5000 bichloride solution were necessary before sufficient anaesthesia was produced to allow the prolapsed shreds of iris to be seized with forceps, drawn out of the corneal wound, and snipped off close.

After being gently douched with bichloride, a drop of atropine, two per cent., was instilled, together with a light dusting of finely pulverized iodoform, the eye was closed with a pad of iodoform gauze and borated cotton, secured by a neatly applied roller.

A strict course of antisepsis was followed for the next two weeks with indifferent success, one day good report, the next day bad; the anterior chamber, however, cleared up sufficiently to show an irido-dialysis even more extensive than supposed; the pupil remained contracted to the minimum, and never responded to the mydriatic, although used in varying strengths, nor was there any sign of the foreign body that had wrought the mischief. His condition from his intense suffering finally becoming so serious that he was confined to bed, he consented to an operation.

The condition of things at this time was most unfavorable for

the securing of even a passable result, the pain was so intense as to be only controlled by opiates ; the iris "ballooned" by the disorganized and cataractous lens entirely obliterated the anterior chamber : the corneal wound had, however, cicatrized ; pupil size of pin-hole, Tn + 2.

The operation was undertaken with the distinct understanding that the eye was to be removed if in my judgment such procedure should be deemed necessary in order to insure the safety of the other, which beyond slight photophobia as yet showed no sympathetic involvement.

The patient was then totally anaesthetized, and the lids and conjunctiva having been made aseptic with bichloride solution, the former were held apart by a stop speculum, and a Graefe incision made involving about one-fourth of the corneal periphery.

The incision was at once followed by the extrusion of shreds of iris, lens substance and some vitreous, but a perfectly clear pupil was secured by the usual, but more prolonged, gentle manipulation of the lower lid and cornea.

Having carefully removed all the damaged tissue within reach, and thorough examination failing to reveal any foreign body, I determined to give the eye another chance, hoping that beneficent Dame Nature might help us out of the difficulty.

The eye was, therefore, closed after thorough douching with bichloride 1-5000, and antiseptic pad being applied, both eyes were finally bandaged and the patient put to bed.

The dressing was not removed for two days, as there was but little pain, in fact relief from all bad symptoms followed the operation at once.

The case progressed steadily toward recovery and was discharged August 24, 1892, with V.O.S. + 12.D. = $\frac{6}{24}$. The pupil is still "pin-hole" in size and the irido-dialysis still exists, but there has been no pain nor subsequent irritation.

The question, however, yet to be answered is, is the bit of steel yet within the globe or did it pass out through the opening in the upper lid at the time it inflicted the injury?

Time will probably answer the query.

THERAPEUTICS OF THE NOSE AND THROAT.*

BY F. F. CASSEDAY, M. D., MINNEAPOLIS, MINN.

APIS MELLIFICA.

Nose—Copious nose bleeding toward morning. Acrid discharge from nostrils. Fluent coryza. Thick-white fetid mucous discharge. Coryza, dry in the morning, fluent in the evening. Sudden coryza at 4 P. M. with dryness of nose, then burning of lips, and sensation as if they would chap.

Creeping, then pressure, in the sinciput. Vertigo. Dry nose. Tip of nose cold with chilliness in the evening. Redness and burning in the nostrils. Itching, soreness, redness, and swelling of the nose.

Nose swollen, red, and œdematous. Burning, itching, stinging eruption upon the nose.

Pharynx—Mouth, throat, pharynx, bright red, glossy as if varnished; in places coated white like scales; mucous membrane covered sometimes with dirty, grayish membrane; not much pain, except in ears when swallowing. Puffy, varnished appearance of the throat. Morning and evening secretion of mucus from the throat. Tenacious mucus in throat, very troublesome. Hawking and clearing throat every morning. Very long palate, looks as if filled with water. Small blisters filled with clear lymph in clusters on back part of throat. Pressive pain in superior and pos-

* Dr. Casseday has favored us with manuscript notes in advance from a work on "Therapeutics of the Nose and Throat," which he expects to publish in the near future. This work will be in two sections, "Materia Medica" and "Therapeutics," and we have been presented with specimens from the MSS. of both parts.

terior part of throat as if from a hard body. Constant soreness of throat. Fauces violet red, both tonsils enlarged, with a throbbing pain. Tonsils red, swelled, painful smarting. Tonsils and fauces erysipelatous. Tonsils swollen, hard; swallowing difficult. Dryness in throat without thirst. Dryness with burning, stinging pains in throat. Violent stitches and throbbing in throat. Heat and smarting in throat with occasional hacking cough. Throat felt constricted and as if a foreign body was lodged in it; deglutition was painful. Sensation of constriction and erosion in the throat in the morning increases to such a degree in eight hours that swallowing becomes difficult. Stinging pains upon attempting to swallow. Talking painful and a feeling as if a large fishbone was in the throat. Pain in ears when swallowing. Difficulty in swallowing.

Voice and Larynx—Hoarseness in morning, throat dry but no thirst. Hoarseness, with dryness and burning of larynx. Hoarseness and scraping of larynx and trachea. Hoarseness with tender larynx, rough throat and dryness. Hoarseness in the morning. Voice hoarse, rough. Speaks in a thick voice, as in quinsy. Speaking is painful; feels as if it wearied the larynx, in which there is a drawing pain.

Clinical—An important remedy in nosebleed. Sometimes useful in coryza, also to be thought of in chronic nasal catarrh.

Nasal polypi are reported to have been removed by apis. (Name of the reporter not accessible.) Affections of the throat and nose concurrent with or sequelæ of erysipelas and scarlet fever are frequently cured by apis. In œdema of the throat, apis is the first remedy to be considered, especially if associated with the characteristic stinging pain, and difficulty on swallowing.

In diphtheria characterized by great debility from the beginning, progressing insiduously. A valuable remedy in diphtheria.

Angina tonsillaris reported cured with apis.

Useful in tonsilitis associated with cutaneous eruptions.

CASE. Hypertrophy of right tonsil, two years, two-thirds lessened in four weeks.

Dry ulcers on tonsils and palate and sloughing abrasions on tonsils have been removed by apis.

Chronic catarrh, many cases reported cured.

Phlegmonous inflammation of fauces.

CASE. Throat painful, pharynx and whole mouth bright red, in some places as if covered with wine dregs, in others three large whitish patches formed by lumps of matter, forming a kind of soft scab, inclined to invade the whole back part of throat. Apis 3c removed this clogged matter.

Often a valuable remedy in quinsy.

CASE. Shivering fit ushering in an attack of cynanche tonsillaris, throat intensely red and swollen, left side worse, cannot swallow a drop of liquid, much fever, headache, pain in limbs.

Chronic laryngitis often yields to apis (many cases reported). Acts on the lining membrane of the larynx; controls a state of inflammation greater than that for belladonna, even after submucous infiltration has taken place.

In œdema glottidis it has a prominent place.

ARSENICUM ALBUM.

Nose—Cannot bear the smell of food. Stuffed cold with loss of smell. Offensive smell. Dryness of nasal cavity. Nosebleed after a fit of passion. Nosebleed with coryza after a fit of vomiting. Distressing stoppage at the bridge of nose. Stoppage of nose and fluent coryza alternating. Burning watery discharge from right nostril (arum, left nostril). Patient sneezes on going into the cold air. Nose seems to be stopped up but still runs. Cold in the head from being chilled while overheated and perspiring. Fluent coryza with frequent sneezing, with hoarseness and sleeplessness with swollen nose. Aggravations at night or after midnight, cold air, except headache, which is relieved. Aggravation from dampness, cold food, and a cold room. Better from warmth. Watery discharge causes

burning and smarting at nostrils as if sore. Pains are accompanied by restlessness, anguish, and desire to change place. Wants to drink often but small quantity satisfies. Thick yellow nasal discharge, with burning and throbbing. Burning in the nose. Great weakness and prostration. Nose cold and pointed, nostrils open and red.

Pharynx—Dryness, soreness, scraping, and burning in the throat. Tonsils inflamed and swollen, and burning like fire. Sensation as if a hair had lodged in the throat. Sensation as if a ball of mucus had lodged in the throat with a taste of blood. Accumulation of green or grayish mucus. Throat very sore and painful. Sensation of constriction of throat. Swallowing very difficult and painful. Burning pain in throat, difficult swallowing. Paralytic condition of pharynx and œsophagus; drinks roll audibly into the stomach. Great anguish; extreme restlessness; fear of death.

Voice and Larynx—Voice hoarse. Aphonia. Voice low, trembling, rough, hoarse, coarse, crowing, or squeaking.

Voice trembling, weak, unequal, now strong and again weak, hoarse, rough, hollow; loss of voice. Spasm of the glottis. Feeling of dryness with burning in the larynx and trachea. Sensation as if inhaling dust. Larynx sensitive to pressure; hoarse by day; suffocative spells at night.

Clinical—Arsenicum is best suited to those catarrhs based upon malarial miasm, and persons suffering from malassimilation. The catarrh to which it is adapted is accompanied with great dryness in the nose, especially in the chronic form of the disease. There is a marked tendency to œdema about the eyes, and puffiness about the nose; complexion is pale and waxy; discharges corrosive in all stages.

A very important remedy in coryza when the discharge is corrosive.

To be considered in cancer affecting nose, throat, or larynx.

Was exhibited with good result in ulcer on right ala nasi, burning, stinging, painful, forming a thick hard crust, which

came off and left a bleeding mattery surface, soon followed by another crust.

Angina herpetica has been cured with this remedy.

Malignant sore throat.

Diphtheria—Diphtheritic membrane is dry-looking and wrinkled; adynamic fever, restlessness and prostration, burning thirst; fetid breath, even gangrene, somnolence, occasionally starts out of bed.

Gangrenous sore throat.

Aphonia. Spasm of the glottis. Laryngeal phthisis.

Spasmodic croup.

Influenza in children, sudden onset, much prostration, child looks though he had been sick a week; violent sneezing with blood tinged discharge. Croup with coryza.

Simulating membranous croup; caused by checked or non-appearing eruption especially hives of urticaria.

Gangrenous croup. Asthma, after suppressed coryza, panting breathing, gasping for air, sensation as if there was dust in the air; worse about midnight and from motion; with groaning and restless tossing.

Asthma when fatigued. Asthma as soon as he lies down to sleep. Asthma of old people, who have occasional attacks of morning diarrhea, rheumatism, scanty secretion of urine, and too violent impulse of heart sound. Asthma at 2 A. M.

BARYTA CARBONICA.

Nose—Smell extremely sensitive. Smells pine smoke. Frequent nosebleed, especially with scrofulous, florid people. Nosebleed before catamenia. Dryness in nose. Fluent coryza. Thick yellow mucous discharge from nose, coryza worse in the morning, nose and upper lip swollen, nostrils reddened, sore, crusty, the secretion of an unpleasant odor.

Pharynx—Scabs behind uvula and posterior nares. Sensation in pharynx as if a fine leaf lay before the posterior nares; morning after waking. Viscid phlegm in fauces especially in the morning. Inclined to horripilla-

tions; chilly when undressing. Head very sensitive to cold (alum, calc, rumex). Cervical glands swollen. Coughs from eating warm food; better from cold diet (phos.). Coughs in the presence of strangers, enlarged tonsils, worse from slightest cold, worse swallowing solids.

Stitches in right tonsil. Inflamed and enlarged tonsils.

Angina worse when swallowing food or saliva. On swallowing, sensation as if food had to force itself over a sore spot. Sensation in œsophagus as if a morsel of food had lodged there. Smarting in throat when swallowing; worse from empty swallowing; throat sore to touch. Stinging when swallowing saliva and during empty deglutition. Attacks of choking in throat after dinner, when sitting and writing, with a sensation as if the thyroid was pressed in, impeding swallowing. Unable to swallow; liquids taken in the mouth were ejected through the nostrils.

Mental symptoms—difficult to fix attention, afraid of being criticized, and will not look up, grief over trifles, thinking of one's complaints makes them worse. (Arum.)

Voice and Larynx—Feeling in larynx, as if breathing smoke or pitch.

Hoarseness and loss of voice, tough mucus in larynx and trachea.

Voice imperfect, aphonia from mucus in larynx. Voice husky, rough. Hoarseness with night cough. Spasmodic cough from roughness and tickling in throat and pit of stomach. Adapted to fat persons, old people, and children with glandular enlargement and large abdomen, weak minds and bodies.

Clinical—Useful in some forms of chronic nasal catarrh.

In acrid coryza, excoriating nose and upper lip, often curative.

Catarrh affecting posterior nares, especially if patient be troubled with frequent epistaxis.

Tip and edges of nose are painful, pimples on alæ nasi.

Scurfs under the nose. Quinsy. Tonsillitis. Chronic enlargement and induration of the tonsils.

Inflammation of cellular membrane of fauces and tonsils with fever, difficult swallowing and speaking.

Throat is pale, instead of having the bright redness of belladonna; submaxillary glands are swollen and tender; breath is putrid; child scrofulous and dwarfish. Scarletina. Diphtheria.

Tonsils inflamed with small pox or scarlatina, especially if merc. or bella. prove insufficient.

Suppurating tonsils. Sore throat and swollen tonsils, with ptyalism; gave speedy relief when symptoms went from right to left.

Angina tonsillaris. Liability to tonsillitis, after every slight cold or suppressed foot sweat.

Chronic angina with great disposition to return.

Chronic induration of tonsils; sensation as if a plug in the throat; worse after swallowing solids. Tonsils tend to suppurate, especially the right; palate swollen; dark brown urine; sleeplessness.

Spasmodic stricture of the œsophagus.

Œsophageal spasm in old people. Aphonia, with bronchitis of old people. Senile asthma. Suffocative catarrh of old people, with impending paralysis of the lungs.

THE UNCERTAINTY AND INSUFFICIENCY OF HOMATROPINE HYDROCHLORATE AS A REFRACTIVE CYCLOPEGIC.

BY F. PARK LEWIS, M. D., BUFFALO, N. Y.

While it is generally recognized that the action of homatropine upon the ciliary muscle is not profound, it is still employed for the purpose of relaxing the accommodation preparatory to making refractive tests. One of our most recent authorities, De Schweinitz, justifies its use when he says that "in order to use this drug it must be employed by cumulative instillations in the strength of 8 to 16 grains to the ounce, one drop of such solution being used every ten or fifteen minutes for an hour and a half preceding the determination, and then waiting forty minutes. At the end of this time the maximum effect of the drug upon the accommodation is secured. In the opinion of some surgeons this drug is an insufficient paralyzer of accommodation, but if caution in regard to the cumulative instillations is observed, and the rule given above carefully followed, very satisfactory results may be obtained."

In all of the cases cited below, which are taken from my case book, a four per cent. solution of homatropine was employed, and its cumulative effect obtained.

In some of them a one per cent. solution of atropine was immediately used after getting the fullest possible results from homatropine. In others, the effects of the homatropine was allowed to disappear, and then the more profound cyclopegic was instilled.

The results, it would seem, fully justify the assertion that

homatropine is so feeble and uncertain in its action that the results obtained are absolutely unreliable, and hence it is entirely misleading and untrustworthy as an aid in determining exact refractive conditions. These cases are taken indiscriminately, and the number might be largely increased with similar results.

| NORMAL ACCOMMODATION. | HOMATROPINE. | ATROPINE. |
|--|--|--|
| 1 { R. E. — 3. D. sph. — 2. D. cyl. ax. hor. V. = $\frac{1}{16}$. L. E. — 6. D. sph. V. = $\frac{1}{16}$. | — 2.50 D. sph. — 2. D. cyl. ax. hor. V. = $\frac{1}{16}$. — 5.50 D. sph. — 1. D. cyl. ax. hor. V. = $\frac{1}{16}$. | — 3. D. sph. — 1.50 D. cyl. ax. hor. V. = $\frac{1}{16}$. — 5.50 D. sph. V. = $\frac{1}{16}$. |
| 2 { R. E. — 1.50 D. cyl. ax. hor. V. = $\frac{1}{16}$. L. E. — 1.50 D. cyl. ax. hor. V. = $\frac{1}{16}$. | + 1.25 D. cyl. ax. 90° — .75 D. cyl. ax. 180° V. = $\frac{1}{16}$. + 1.25 D. cyl. ax. 90° — .75 D. cyl. ax. 180° V. = $\frac{1}{16}$. | + 2. D. cyl. ax. 90° V. = $\frac{1}{16}$. + 2. D. cyl. ax. 90° V. = $\frac{1}{16}$. |
| 3 { R. E. + .50 D. sph. V. = $\frac{1}{16}$. L. E. + 2. D. sph. V. = $\frac{1}{40}$. | + 3. D. sph. V. = $\frac{1}{16}$. + 4.50 D. sph. V. = $\frac{1}{30}$? | + 4. D. sph. V. = $\frac{1}{16}$. + 5. D. sph. + .50 D. cyl. ax. hor. V. = $\frac{1}{16}$. |
| 4 { R. E. + .50 D. cyl. ax. 90° V. = $\frac{1}{16}$. L. E. + .50 D. cyl. ax. 90° V. = $\frac{1}{16}$. | R. E. + 1.25 D. sph. V. = $\frac{1}{16}$. L. E. + 1.25 D. sph. V. = $\frac{1}{16}$. | + 1.50 D. sph. + .50 D. cyl. ax. hor. V. = $\frac{1}{16}$. + 1.50 D. sph. + .50 D. cyl. ax. hor. V. = $\frac{1}{16}$. |
| 5 { R. E. + 1.50 D. sph. V. = $\frac{1}{30}$. L. E. + 1.50 D. sph. V. = $\frac{1}{30}$. | R. E. + 3. D. sph. V. = $\frac{1}{30}$. L. E. + 2. D. sph. V. = $\frac{1}{30}$. | + 2.50 D. sph. + 1.50 D. cyl. ax. 90° = $\frac{1}{30}$. + 2. D. sph. + 1.50 D. C. ax. 90° = $\frac{1}{30}$. |
| 6 { R. E. + 1. D. cyl. ax. 90° V. = $\frac{1}{16}$. L. E. + 1. D. cyl. ax. 90° V. = $\frac{1}{16}$. | + .75 D. cyl. ax. 90° V. = $\frac{1}{16}$. + .75 D. cyl. ax. 90° V. = $\frac{1}{16}$. | + .75 D. sph. + .75 D. cyl. ax. 90° V. = $\frac{1}{16}$. + .75 D. sph. + .75 D. cyl. ax. 90° V. = $\frac{1}{16}$. |
| 7 { R. E. + .25 D. sph. + .25 D. cyl. ax. 180° V. = $\frac{1}{16}$. L. E. + .25 D. sph. + .25 D. cyl. ax. 180° V. = $\frac{1}{16}$. | + .50 D. sph. + .25 D. cyl. ax. 180° V. = $\frac{1}{16}$. + .50 D. sph. + .25 D. cyl. ax. 180° V. = $\frac{1}{16}$. | + 1.25 D. sph. + .25 D. cyl. ax. 180° V. = $\frac{1}{16}$. + 1.25 D. sph. + .25 D. cyl. ax. 180° V. = $\frac{1}{16}$. |
| 8 { R. E. + 1. D. sph. V. = $\frac{1}{16}$? L. E. + 1. D. sph. V. = $\frac{1}{16}$? | + .50 D. sph. + .75 D. cyl. ax. 90° V. = $\frac{1}{16}$. + .50 D. sph. + .75 D. cyl. ax. 90° V. = $\frac{1}{16}$. | + .75 D. sph. + 1. D. cyl. ax. 90° V. = $\frac{1}{16}$. + .75 D. sph. + 1. D. cyl. ax. 90° V. = $\frac{1}{16}$. |
| 9 { R. E. Not recorded. L. E. | + 1. D. sph. + .75 D. cyl. ax. 180° V. = $\frac{1}{16}$. + 1.25 D. sph. + .75 D. cyl. ax. 180° V. = $\frac{1}{16}$. | + 1.50 D. sph. + .75 D. cyl. ax. 180° V. = $\frac{1}{16}$. + 2.25 D. sph. V. = $\frac{1}{16}$. |
| 10 { R. E. + 1. D. sph. V. = $\frac{1}{16}$. R. E. + 1. D. sph. V. = $\frac{1}{16}$. | + 1. D. sph. V. = $\frac{1}{16}$. + 1. D. sph. V. = $\frac{1}{16}$. | + 1.25 D. sph. V. = $\frac{1}{16}$. + .75 D. sph. + .75 D. cyl. ax. 90° V. = $\frac{1}{16}$. |

In many cases the homatropine records followed by atropine are unchanged, but the above will suffice to show the uncertainty and insufficiency of the action of homatropine in relaxing the accommodation and its uselessness as a cyclopegic in determining refractive errors.

AN IMPROVED NASAL NOZZLE FOR POLITZER'S INFLATION.

BY JAMES A. CAMPBELL, M. D., ST. LOUIS.

Various modifications of Politzer's original instrument have been offered, and nasal tips of many forms have been devised, but the small oval hard rubber bulbous nozzle made for me by A. S. Aloe & Co., serves me best for general purposes, and has met with the unanimous approval of all the patients upon whom I have used it.

Its form and size enables it to be used in the most sensitive nose, with the least possible irritation, and obviates the tendency to bleed, which is frequently seen in such cases.

Its simplicity will be seen and appreciated from the accompanying cut :



A FENESTRATED CHALAZION SPATULA AS AN AID IN LID TUMOR OPERATIONS.

BY JAMES A. CAMPBELL, M. D., ST. LOUIS.

Everyone dealing with small cystic tumors or chalazia of the eyelids, will recall the difficulty which is at times experienced in evacuating their contents after incision is made. This is particularly the case when the tumor is located in the vicinity of either the outer or inner canthus, more marked in the lower than in the upper lid, and especially pronounced where the incision is made through the conjunctiva.

To overcome this difficulty I am pleased to offer a very simple little instrument made for me by A. S. Aloe & Co., of this city. I have named it the fenestrated chalazian spatula.



A. S. ALOE & CO

It is simply a strip of firm German silver, three and one-half inches long and one-half inch wide at one end and a trifle less at the other end. The ends are rounded and fenestrated (ring shape), the larger being three lines in diameter and the smaller two lines in diameter.

After the necessary incision is made the opening of the instrument is placed over the cut and simple pressure made with the finger on the opposite side, readily empties the

contents of the tumor with the least possible irritation or injury to the surrounding parts.

In cases where the incision must be made from the outside, a little device, similar to the old style Desmarres entropium forceps, but about one-half the size, and with a round opening instead of the oval form, pressed over the tumor before the incision is made, will be found a very safe and convenient instrument, especially in nervous persons who are liable to make sudden moves at the wrong time. After the incision is made it allows the ready evacuation of the contents without removal of the instrument.

HEMORRHAGE INTO THE ANTERIOR CHAMBER OF THE EYE FROM COUGHING.*

BY ALTON G. WARNER, M. D., BROOKLYN, N. Y.

The books have very little to say about hyphæmia or hemorrhage into the anterior chamber. A dozen lines is the average amount of space devoted to the subject. It is characterized as spontaneous or traumatic in origin. In the latter case it may be due to a wound of the cornea, iris, or ciliary body, or it may be produced by a blow upon the eye without any rupture of its external coats. Dislocation of the lens is apt to occur in such instances. The authorities also tell us that spontaneous hemorrhage is of very rare occurrence. That cases have been known where it could be produced at will by shaking the head. That it may occur in tumors of the eye, hemorrhagic glaucoma and severe iritis and cyclitis, also in hæmophilia.

I have recently had a case under observation in which the hemorrhage was so abundant, so persistent, and the eye presented so peculiar an appearance, that I trust I may be pardoned for relating it.

J. W., age seventeen, presented himself at my clinic at Brooklyn Homeopathic Hospital Dispensary, December 6, 1892, saying he had a cold in his eye.

Eyes were prominent, suggesting myopia. O. D. vision $\frac{15}{100}$ with concave lens, 4.D. vision $\frac{15}{50}$, cannot improve beyond this, O. S. vision O. slight conjunctivitis, anterior chamber half full of blood. Pupil slightly irregular, margin of iris completely adherent to lens capsule, lens cataractous, having undergone calcareous

* Homeopathic Medical Society, State of New York, February, 1893.

degeneration. Tension of eye-ball minus. The patient is not endowed with any excess of intelligence, and was unable to give any clear history. He did not think he could ever see well with the left eye, but could not tell when it failed entirely. He only noticed that the eye became red a few weeks ago. Was confident he had never had any blow upon the eye. Could give no history of hæmaphilia. Had been coughing, sometimes quite severely, for a month past. This cough I concluded must be the exciting cause of the hemorrhage. The case has been under observation at intervals up to the present time, over two months. Have not been able to keep a bandage on the eye, as his attendance is so irregular, and he is so utterly incorrigible. Mydriatics fail to dilate the pupil and cause pain. Under remedies to allay the cough followed by arnica or ham. partial absorption of the blood has taken place, but a fresh cold with return of the cough has reproduced it. At no time since I have seen him has the anterior chamber been entirely free from blood. There has never been any disposition to formation of a clot, the blood always gravitating in the direction in which head was turned.

My theory of the history of the case is that he had a chronic irido-choroiditis. The inflammation began presumably in the choroid. Being myopic, a detachment of the retina easily followed. Then the lens became opaque, beginning with a small spot, and then involving the entire lens substance. Later on the lens has undergone further degenerative changes and become chalky. Iritis has followed insidiously, and adhesions of iris to lens occurred. This process has extended over years of time. The blood vessels of the iris have become degenerate, and bleed from friction with the rough lens when severe cough occurs. The eye will probably atrophy.

NOTES ON AN IMPROVED SOLUTION OF COCAINE.

BY IRVING TOWNSEND, M. D.

The wonderful progress made in the domain of nose and throat surgery in the past decade has undoubtedly been made possible by the discovery of the anæsthetic effect of cocaine. Our best and most reliable drug for inducing local insensibility to pain, its use has been attended by one great serious drawback, viz., its toxic effect.

Everyone accustomed to the frequent use of solutions of this drug, whether employed on mucous membranes or hypodermically, must have observed many times distinctive poisonous effects, and occasionally of such a serious nature as to be alarming. Even when used in the weaker solutions we can never feel sure that we may not have a case of cardiac depression to deal with. There are many who are particularly susceptible to the effects of this drug, especially women of neurotic tendency, and I have become more cautious in its use in patients of this class.

The first symptoms marking poisoning by cocaine are, pallor of face, perspiration about the mouth, a pinched anxious expression, small rapid pulse and nausea, in short, symptoms due to cardiac depression.

As a means of obviating the toxic effects of cocaine, I have employed for the past eighteen months solutions of cocaine muriate (four to ten per cent.) to which is added twenty minims to the ounce of phenol as suggested by Gluck (*vide Medical Record*, June 21, 1890). During this time I have not had a case of poisoning worthy of men-

tion from this mixture. As an anæsthetic it is more effective than cocaine alone, the phenol having well known properties of its own, increases and prolongs the anæsthetic action, and by virtue of its power to coagulate albumen prevents or retards to a considerable extent the absorption of the cocaine into the system, thus curtailing its constitutional, and at the same time intensifying its local, effect.

My solutions have been made with the muriate of cocaine and phenol C. P., but a chemical compound known as cocaine-phenylic has recently been introduced by Merck.

It is not at all, or very slightly, soluble in water, but readily soluble in alcohol. In the *Aertzliche Rundschau*, No. 9, 1892, Dr. Von Oefele reports its successful use by him in local inflammation of mucous membranes of nose throat, and also in conjunctivitis, the latter frequently and requiring only one application to effect a cure. Von Oefele used the drug in solution in equal parts of alcohol and water, and also by insufflation in combination with boric acid and bismuth.

Messrs. McKesson & Robbins of New York have introduced a compound under the name of "phenate of cocaine." A comparison of the two preparations leads me to conclude that they are identical. I have not used this salt enough to be able to say whether it has any advantage over this solution of the muriate with phenol above described.

The antiseptic and germicidal properties of phenol render aseptic the field of operation to which it is applied, as well as keeping free from germs the solution itself.

It is also the fact that inflammatory reaction after operation is greatly diminished. Lastly, and by no means least, toleration for the drug, demanding stronger solutions, is not established, and the ill effects on the nervous system from prolonged use are likely to be avoided. As far as my knowledge goes Gluck was the first to use this solution in this country, and my only excuse for presenting these brief notes is the belief that it is not used to any extent at present, and also the conviction that it is superior in every

way to the simple solution as commonly used. The advantages of the cocaine phenol solution may be summarized as follows ;

- I. Obviates toxic effect.
- II. Augments anaesthetic effect.
- III. Renders aseptic the solution and the field of operation.
- IV. Diminishes inflammatory reaction.
- V. Prevents chemic systemic poisoning and renders improbable the cocaine habit.

SENEGA IN THE TREATMENT OF HYPERPHORIA—A CRITICISM.

BY HAROLD WILSON, M. D., DETROIT, MICH.

In the January number of this journal, there appears an article by E. H. Linnell, M. D., upon "Senega in the Treatment of Hyperphoria and its Resultant Symptoms." The author claims to have used the drug "extensively" in his practice, and upon a critical analysis of the large amount of material in his possession bearing upon its usefulness, has selected seventeen clinical cases. By these cases he "hopes to be able to demonstrate conclusively that in senega we have a valuable remedy for the cure of deviating tendencies of the eyes in a vertical direction, and for the relief of the distressing symptoms arising from such a cause." This is the thesis of the paper. If it be proven, the paper must be looked upon as a valuable contribution to the therapeutics of eye diseases. If it be not proven, we must be careful to understand the fact, so that we shall not incorporate into our therapeutic text-books, under senega, "hyperphoria, and its resultant symptoms," as clinical symptoms of the remedy upon the evidence here set forth.

It must be borne in mind that Dr. Linnell has used the remedy extensively in the treatment of ocular affections, presumably muscular, and that the seventeen cases reported are selected from the mass of material on hand, as being those best adapted to prove its special curative action. We are thus led to expect evidence of the most conclusive sort as to the curative effect of the drug, particularly as the treatment pursued in these cases is believed "from quite

an extended experience" to be very much superior to tenotomy. From the excellent results which tenotomy has been known to give, one must have had pretty convincing evidence before him, to have reached such a conclusion. We are all agreed that tenotomy for hyperphoria is a confession on the part of the operator that he knows of no better way of curing his patient. Every tenotomy maims the tenotomized muscle, more or less. It is true that when the operation is skillfully performed, this maiming is of little or no practical account, but it is maiming, nevertheless. If remedies given internally will accomplish the same results, so far as concerns the restoration of a perverted muscular equilibrium and the relief of the consequent symptoms, certainly they are the means of cure toward which the intelligent physician must look. But we must be careful to scrutinize the grounds of our faith in drug action.

Let us turn to these cases of Dr. Linnell's, and subject them to a little careful scrutiny, and see what legitimate inferences concerning the curative action of senega upon hyperphoria or its resultant symptoms they are really capable of supplying. I shall briefly outline the history of each case, commenting upon each in turn, and shall finally contrast the summary of these comments with the *résumé* given by the author himself. For fuller histories of these cases, the reader is referred to the original paper.*

CASE I. Refraction hyperopic. Glasses relieved for a year; then asthenopia from hard study. Ex. 0.5° , hyp. not recorded. Exercise with prisms relieved for six months, then more trouble, and Rh. 0.5° , Ex. 15° . Treated by means of exercise with horizontal and vertical prisms, and senega 1x. In ten days orthophoria for far and near. No asthenopia after a year.

This case was subjected to what the author calls "the mixed treatment," and as the curative effects of systematic exercise and faradism are certainly something, it is impos-

* JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY, AND LARYNGOLOGY, January, 1893, p. 10, *et seq.*

sible to estimate even the effect senega may have had in securing the final result. Furthermore, there is nothing to show that at the end of the year during which the patient was free from asthenopia the orthophoria, which was secured during the first ten days of treatment, persisted.

CASE II. Refraction am. with presbyopia, but no definite statement otherwise as to the amount or character of the refractive difficulty given. Glasses (though of what sort is not stated), were prescribed, *natr. mur.*, given, and considerable relief followed. Examination then showed Rh. 1° . Senega 6x given, with prompt relief. No subsequent examination recorded.

This case is reported as one in which a Rh. of 1° was cured by the remedy alone. Looking at the record of the case we see that glasses were prescribed, and gave relief, which, although not complete at first, might have become so later without any further treatment. The only record of the muscular condition is that of the existence of Rh. 1° . After the asthenopia was relieved no examination was made, and it is certainly a very violent assumption to say that at this time no hyperphoria existed. What the history of the case really shows is that considerable relief followed glasses and *natr. mur.*; that under the administration of senega, and the presumable wearing of glasses, a pain in the right eye disappeared, and the patient was comfortable during the ensuing six months; that at one time a Rh. of 1° existed. It is possible that the senega relieved the pain in the right eye, but no particle of evidence is given to show that it had any effect whatever upon the hyperphoria. Whatever else this case shows, it does not show that senega cured a Rh. of 1° .

CASE III. Refraction Ah, nothing more definite given. Neither age nor any personal history of the patient is given, Lh. 5° , Es. 2° . Patient complains of constant diplopia. This diplopia was intermittent for a year or so, but is now constant. "Right eye stands too low, and turns in; has diplopia to the right of middle line." In ten days, under gels. and exercise (Query: How exercised?) Lh. 3° , and Es. 0° . A week after patient still under gels., Lh. 5° . In ten days, Lh. 4° , and after prism exercise (how?) in

office, Lh. 2° . Senega 6x and prism 2° for constant wear prescribed. In two weeks the diplopia had disappeared (when the glasses were worn?) but Lh. 3° . Rhus was then prescribed, and the 2° prism continued. The patient then had diplopia except when correcting prism was worn. Now a year elapsed, and no medicine was given, at the end of which, Lh. was 1.5° . Then a compound cylindrical prism was prescribed for constant wear, and the patient did well for a year, Lh. now 2.5° . Some peculiar experiments with prisms were then tried without affording relief, and senega 1x was prescribed, following which the patient got on comfortably for eight months, when Lh. 2° was found upon examination, and the patient put upon conium.

By the author's own admission, it is impossible in this case to say to what extent senega was of any value. The case is evidently one of paresis or spasm of some of the ocular muscles, although the symptoms given are too meager to enable us to determine just what muscle was at fault, or even which eye. It is not clear how the gymnastic exercise of the eye muscles was to be obtained with prisms when there was constant diplopia. It is ordinarily believed that in order to accomplish this sort of exercise binocular single vision is a *sine qua non*. It would have been better to have told us how it was done. As for the alleged effect of senega or other remedies in reducing the hyperphoria from 5° to 2° , the record shows that in a year's time, with no medicine at all, it fell from 3° to 1.5° . Now, if this much can happen without any medicine, it makes the influence of remedies problematical, especially since under the administration of senega it eventually remained 2° .

CASE IV. Headache, etc., Rh. 3° , Es. 8° . Refraction not stated; $\frac{1}{18}$ in. prescribed for near point, also faradism, prism gymnastics, and senega. Length of treatment not stated, but finally orthophoria, far and near.

The author admits that the evidence in this case as to the action of senega is not conclusive. It is an example of the "mixed treatment," and, as in Case I, must necessarily be inconclusive.

CASE V. Headache ; muscular condition varied greatly ; Lh. 4° , Es. 2° . Senega and systematic exercise for one week, when Lh. was 1° , Es. $< 1^{\circ}$. The senega was then discontinued (why?) and onosmodium given. In a short time there was no hyperphoria, and Es. was only 0.5° , and patient was relieved of the headache, etc.

The author says "in this case senega was not of much benefit." Under senega and exercise, however, the hyperphoria fell from 4° to 1° in one week ; and while it is true that the case does not establish anything for senega, it is as good evidence of its curative value in hyperphoria as Case I. It would appear to make out a much better showing for onosmodium.

CASE VI. Headache and asthenopia. Correcting compound cylinders prescribed, though it does not appear whether for near or far point or both. Glasses with remedies relieved for three months, then remedies did no good, Lh. 5° , Es. 5° . After one month's treatment with prism gymnastics and electricity, there was orthophoria for far and near. Senega was given "for only about four days, and without perceptible improvement. No medicine was taken during most of the time she was under treatment."

Here, again, senega admittedly did no good. The case is of no value then as showing the beneficial effect of senega, but is of much value in showing what electricity and prism gymnastics are capable of doing to relieve conditions of heterophoria, as by their use a hyperphoria of 5° was relieved without the aid of any medicine whatever. The results in this case throw some light upon those other cases where what has been called "the mixed treatment" was used ; meaning the use of electricity and prism exercise combined with the administration of some drug. If the two former agents can alone effect such a striking reduction in the degree of hyperphoria in a given case, it is natural to expect them to have some influence even when remedies such as senega are given at the same time. It becomes impossible, therefore, in any case where the "mixed treat-

ment" has been used, to make any very satisfactory inferences as to the action of the drugs employed.

CASE VII. Chronic headache and asthenopia. Refraction not given. Lh. 2.5° , Es. 2° . Under electricity and prism gymnastics, together with onos., in two months there was only Lh. 1° , and with argent. met. in place of the onos. there was orthophoria in three months for far and near. Three months later there was Lh. 1° , Es. 0.5° . Senega was then prescribed, and the next day hyp. was zero. No examination was made after this, but the patient wrote that the eyes were comfortable.

In this case the heterophoria was apparently completely relieved by other means before the senega was given. After a slight relapse senega was given, and the next day there was no hyperphoria, but no subsequent examination was made to ascertain whether this condition was permanent. If the headache was due to the heterophoria, the correction of this condition ought to have relieved it; senega may have relieved the asthenopia, but it obviously had no certain connection with the hyperphoria, for a state of orthophoria had already been once obtained under the administration of argent. met. and systematic exercise some three months before, and as no subsequent examination was made the final result, so far as the muscular equilibrium is concerned, is in doubt. Moreover, though the patient may have been free from headache and asthenopia, this is no certain sign of the existence of orthophoria.

CASE VIII. Headache. The refraction was not given, but glasses of some sort were prescribed, with which near work was comfortable. Lh. 8° . Senega 6x was prescribed, and in five days Lh. 1° , but the headache was no better. In five days more the headache was better and the hyperphoria remained the same. After three weeks the headache was still severe; Lh. the same. Prismatic cylinders were given for constant use, and mellilotus 1x. Subsequently, under conium and these glasses, the head was better. The conium was continued for a few weeks and followed by natr. mur. For two years very little headache, at which time Lh. was 1.5° and Ex. 1.5° .

The author cites this case as showing the cure of hyperphoria by the use of senega alone. There seemed to have been a remarkable reduction of hyperphoria from 8° to 1° in five days under the administration of senega, but it is curious that this residuum of 1° should have been so constant and persistent. The patient's headache evidently did not originate from the hyperphoria, for it persisted long after the hyperphoria had been lessened to this astonishing degree. The result is so unusual that it naturally excites a little incredulity, and we are led to wonder if it is not possible that the author might not have made some error of observation or record.

CASE IX. Asthenopia. Some refractive error, not specified, for which glasses were prescribed, and various remedies given, with some relief, although the glasses were not very well tolerated. Lh. 0.5° , Ex. 2.5° , orthophoria in accom. After three months intermittent use of the glasses, with some pain in right eye still present, senega *rx* was given, and in six weeks the patient could use the eyes freely, and wore the glasses with great comfort; in fact could not get along without them. Lh. still 0.5° and Ex. in accom. 8° .

Curiously the author reports this case as one cured by the medicine alone. The record shows plainly enough that a refractive error of some sort was corrected, and that the glasses prescribed eventually not only gave the patient relief, but became a necessity. It is a pity that the refraction is not given in the history of the case. So far as the action of the senega is concerned, it did not seem to have had any effect whatever upon the hyperphoria, for this remained at the end of the treatment the same as it was at the beginning. The most that seems possible to claim for the drug here is, that while it was being administered, the patient grew to tolerate and get the benefit of her glasses. In this case orthophoria in accom. is recorded, with a Lh. of 0.5° for distance. Does this mean that the hyperphoria disappeared in accommodation? This is not usual, to say the least.

CASE X. Lh. 0.5° . Glasses $+\frac{1}{60}$ in. were prescribed, also senega. At the end of a year's time an examination revealed no hyperphoria.

This case is also cited as one in which the drug alone effected the cure of hyperphoria. Possibly it may do so, in Case III we find a hyperphoria of three degrees reduced to two in the course of a year, without any medicine at all, and it is a matter of common observation that the records of muscular balance may show a spontaneous variation if examined from day to day. Under these circumstances is it not rather a forced claim to say that we have here any reliable evidence that senega cured the case, or indeed that it had any necessary relation to the observed change in the muscular equilibrium?

CASE XI. Slight asthenopia and occasional headaches. Rh. 0.5° . Senega and prism gymnastics were prescribed. In a month the eyes were better, but there was still Rh. of 0.5° . Senega continued. In three weeks orthophoria for far and near. Three months later, the same.

This is another case of "mixed treatment," and while it would not be fair to say the senega was of no service it is impossible to affirm that it was.

CASE XII. For six years under physos. spig., and onos., the patient had been able to use eyes pretty comfortably with her glasses. The refraction is not definitely given in amount, but there was spasm of the accommodation with H. and Ah. Examination showed Rh. 1° , onos. for eight days, when Rh. was reduced to 0.5° . Then senega for nine days; Rh. the same. Vertically refracting prisms worn each day for a week, and senega continued. No hyperphoria. In about a month, under senega and both vertical and horizontal prisms, Rh. 0.75° ; two weeks later orthophoria and asthenopia was relieved.

In this case, senega is credited with relieving 1° of Rh., but before taking this drug, the hyp. had already been reduced one-half, and during the time it was taken vertically refracting prisms were worn more or less constantly.

Now the influence of wearing prisms upon the equilibrium of the muscles is very marked in some cases, and is sufficient without other measures being employed, to affect the degree of hyperphoria as shown by the phorometer, very decidedly. The simultaneous use, then, of prisms and senega in this case, renders the evidences of drug action obscure.

CASE XIII. Refraction not definitely given, except that there was Am. and that glasses had been prescribed and used with benefit. Rh. = 0.5° , onos. given, and three days afterward there was orthophoria for far and near. Senega was then given, and in nine months Rh. was 0.5° . Agaricus was then given, with exercise with prisms, under which Rh. was 1° , and then senega only. In one month, Rh. was 0.5° . In seven months (under senega?) there was no hyperphoria, but two months later Rh. 0.5° , after which under senega and faradism, orthophoria was again established, and lasted for six months.

This case is somewhat difficult of analysis. All that the author claims is that "the results were more satisfactory and permanent while taking senega." It does not seem to be apparent that the senega had any marked effect upon the muscles, whatever it may have done for the asthenopia.

CASE XIV. Slight asthenopia. As usual refraction not given definitely. Rh. 4° . Senega 1x and in three days without other treatment, Rh. 2.5° . Then senega and prism exercises, and in ten days, Rh. 1.5° . Senega continued and in three days more Rh. 2.5° . Six months later, after wearing a prism of 2° base up, left eye, and continuing senega, Rh. = 3.5° .

Under senega only, Rh. 4° was reduced to 2.5° . If the record of the case had stopped here, it would seem to show that the drug really caused the reduction. Unfortunately, however, after the hyperphoria had been still further reduced under other treatment, senega was resumed alone, and in the course of six months, in spite of the drug, the hyperphoria rose to 3.5° , which was practically the same as when treatment was begun. We are therefore forced to conclude

that whatever the drug might have done, since the hyperphoria both increased and decreased under its administration, the evidence of any curative action from it is not clear.

CASE XV. No asthenopia. Refraction Ahm. but not definitely given. Rh. 0.5° , Ex. 10° . Glasses of some sort were prescribed and senega given. After wearing the glasses and taking the medicine for three weeks there was orthophoria for far and near.

Hyperphoria of 0.5° , is well known to appear and disappear without any medicine at all having been given in some cases. Moreover, it is not easy to say that the glasses did not have some effect in bringing about the final result. It would have been as well to state whether the heterphoria was measured at all times with the correcting glasses on. We are led to infer that the first determination of the muscular balance was made without proper correction of the refraction.

CASE XVI. Chronic headache. Refraction astigmatic, but not specified in detail. Ruta was given, and vertical prisms for exercise. In eight days there was no change. Suitable cylinder combined with a prism of 0.5° base up right eye were then prescribed, and senega 6x, together with prism exercise and faradism. In ten days there was orthophoria, "with her glasses." The patient was relieved of the headache and asthenopia.

It is very misleading to record orthophoria in a case of hyperphoria when the examination is made under a correcting prism, as the author has done in this case. Certainly if a prism of 0.5° was necessary to produce orthophoria, the real condition of the eye was one of heterophoria. This is another instance of "mixed treatment" and as in other cases of that sort, it is utterly impossible to form any opinion as to what effect the senega may have had.

CASE XVII. H and Ah, but no definite statement as to the amount of either. Glasses were prescribed which relieved very much. Senega was then given for "suspected latent hyper-

phoria." A week after, reported no headache. Well for four months, when pain returned. Lh. then 0.5° . Senega was then prescribed, and patient was not seen afterward.

The history of this case shows that the correction of the refraction relieved the patient very much. The surprising indication for senega, is "for suspected latent hyperphoria," and oddly enough, after the patient has been practically well for four months, and suffers from a slight return of headache, we find Lh. = 0.5° . There is no record of the condition after the hyperphoria was discovered, and we do not know whether it became more or less. In fine, the action of senega here is not shown by the history as reported, nor is it even proved that it had any appreciable effect at all.

Summary.

One serious imperfection of these case-histories is the almost complete absence of any definite record of the refraction, or of the correcting glasses given. Refractive errors play so large a part in the production of asthenopia, that even if the author is convinced that their influence may be disregarded in any given case, his readers would be better satisfied to know what the refractive condition was, and what efforts were made to correct it. The following summary of the results obtained in the seventeen cases above quoted, is intended to embody such conclusions only as may legitimately be drawn from their histories. The canons by which they are judged are only those common to all scientific experiments.

CASE I. "Mixed treatment" with glasses. No conclusion is here possible as to what effect senega might have had if given alone.

CASE II. Asthenopia relieved probably by medicine or glasses, or both, but no change in the hyperphoria.

CASE III. "Mixed treatment" with glasses. Hyperphoria lessened both with and without treatment; also increased under senega. Impossible to differentiate the effect of senega.

CASE IV. "Mixed treatment" with glasses. As in Cases I and III, no proof possible.

CASE V. "Mixed treatment." Case admittedly proves nothing for senega.

CASE VI. Same as Case V.

CASE VII. Senega may perhaps have relieved a hyperphoria of 0.5° ; doubt is cast upon this possibility by the previous history of the case.

CASE VIII. An apparent reduction of hyperphoria from 8° to 1° in five days by senega alone. This result is unfortunate in being too good. It is also incomplete, as hyp. of 1° persisted for many months, unchanged in spite of the continued administration of senega.

CASE IX. The remedy had no effect upon the hyperphoria.

CASE X. There is here no evidence showing that the remedy did or did not cure the hyperphoria.

CASE XI. "Mixed treatment." No proof.

CASE XII. Entirely inconclusive.

CASE XIII. Author thinks that senega was of "some benefit." This is evidently a general impression rather than a demonstrable fact.

CASE XIV. Under senega, the hyperphoria both lessened and increased. How, then, can we say that its action was curative?

CASE XV. As in Case X hyperphoria of 0.5° appears and disappears too often spontaneously to afford much evidence for or against remedial action.

CASE XVI. "Mixed treatment," and moreover, the hyperphoria was unchanged at the end of the treatment.

CASE XVII. A hyperphoria of 0.5° seems to have developed during treatment.

From this summary, we see that not one case out of the seventeen gives any adequate proof that senega had any action whatever upon the ocular muscles. This is not to say that it had none, but the evidence presented does not establish the fact. If no curative action upon the hyperphoria itself is demonstrated, it follows, *a fortiori*, that

nothing is proven with regard to any supposed reflex effects that hyperphoria is credited with originating. If in a case of hyperphoria with asthenopia, as in Case IX, the asthenopia is relieved, while the hyperphoria persists, it is a just conclusion to affirm that the asthenopia was not related to the hyperphoria. The author reports Cases II, VIII, IX, X, XV, XVII, as having been "cured by the medicine alone," and claims that some curative effect is shown in most of the other cases. How utterly such a statement lacks the necessary proof the reader may judge for himself. Such claims, if not justifiable, are apt to do harm to our therapeutics; for many readers will take the author's conclusions as established, without attempting to verify them, and may, perhaps, incorporate into our literature these unwarrantable assumptions. So far as the special symptomatic indications for senega are concerned, they fall to the ground with the main conclusions. The very best that could be made out of them, in any event, would be a collection of empirical symptoms for the administration of senega, more or less valuable, perhaps, but having no necessary connection with homeopathy. The homeopathic therapeutics of eye diseases can never be built upon such foundations as Dr. Linnell offers in this paper. If we wish to find out what senega can do homeopathically in the cure of diseases, we must first have adequate provings of it, and base our therapeutics primarily upon these provings. If clinical symptoms are to be of any value, they must be supported by strong evidence. In the treatment of muscular anomalies of the eyes by drugs, we must furthermore bear in mind that there are variations in the muscular balance of the eyes occurring independently of drug action, the effects of which must be carefully differentiated from those which remedies may produce. In fine, if we are to make real progress in medicine, we must be both scientific and logical.

FEBRUARY, 4, 1893.

Mr. Editor :

Will you allow me a few words in reply to Dr. Wilson's criticism of my paper, which appeared in the January issue of your journal, entitled "Senega in the Treatment of Hyperphoria and its Resultant Symptoms"?

The object of my paper was to encourage the treatment of heterophoria by exercise, electricity, and internal medication, instead of by tenotomy. The term "mixed treatment," to which Dr. Wilson seems to so strongly object, was quoted from an article by the late Dr. George S. Norton upon a similar topic. I endeavored to illustrate the usefulness of senega in such cases, especially in hyperphoria, and failures are as instructive as successes in enabling us to determine the special adaptability of a remedy in a given disorder.

My object was *not* to prove that senega will cure every case of hyperphoria, neither was it my object to introduce into the materia medica or into special treatises a "collection of empirical indications" for a new and unproven drug. I simply offered verifications of recommendations of others, especially of Dr. George S. Norton, adding a few clinical symptoms which my experience has led me to consider reliable, and since Dr. Wilson is under the impression that no provings of the drug exist, I beg to refer him to a treatise upon materia medica by Nothnagel and Ross, and to Allen's Encyclopædia, vol. iii. p. 287.

In reply to Dr. Wilson's reiterated censure because errors of refraction and details of correction of the same, and also of the use of prisms were omitted, I have to say that the paper was written for the New York State Homeopathic Medical Society, composed largely of general practitioners.

The objects of the paper would not have been furthered by such details, and they would have rendered it inappropriately and tediously long. The results attained demonstrated the correctness of this part of my treatment. It was not written for the specialist, but was published at the request of the editor. Had I written for the specialist I

should have reported the cases more in detail, and have more sharply differentiated between a cure of the hyperphoria and a cure of the attendant asthenopia.

Dr. Wilson's verdict of unproved, in cases that were not examined after a satisfactory cure was established, is of no more weight than a similar criticism of other disorders dismissed after satisfactory treatment.

His assumption that the drug was continued during the long period that elapsed in a few of the cases between a relief or apparent cure and a return of the hyperphoria, and his argument that therefore the trouble increased or developed during the continuous administration of the remedy, is entirely unwarrantable and utterly false.

The fact remains that my cases were relieved of all or nearly all the discomforts associated with the heterophoria, and were restored to comfortable use of their eyes.

If Dr. Wilson will try the remedy, or even the "mixed treatment," in an equal number of cases and report the result, he will confer a favor upon the profession, and contribute valuable evidence toward establishing or overthrowing the claims of "senega in the treatment of hyperphoria."

Very truly yours,

E. H. LINNELL.

AN OBSERVATION MADE IN CASES OF HETEROPHORIA.

BY JOHN H. PAYNE, M. D., BOSTON, MASS.

I have frequently noticed during the examination of a patient calling upon me for advice, the presence of a peculiar symptom that I can find no mention of in our usual text-books or in the various articles that appear from time to time in our magazines, and yet that seems to be a constant attendant of certain muscular anomalies that are daily met with in the practice of all oculists. I refer to an asthenopia that occurs when the eyes are used by artificial light alone. Such eyes are very comfortable when used by an ordinary daylight, but experience the most intense shrinking from an effort made during artificial illumination. There may or may not be photophobia, but there is decided asthenopia. A further examination of such cases will invariably reveal a disturbance in the muscular balance of the two eyes, a heterophoria of some form that seems to be at the foundation of the whole disturbance. Such cases usually yield to a carefully adjusted prism glass or to a guarded tenotomy. They are not explained by the theory of fatigue by the day's work, and consequent irritability as evening advances, for the symptom is as prominent when the eyes are used under conditions of artificial illumination during the early part of the day. I have observed it more frequently in *exophoria*, and have become accustomed to regard it as in a measure diagnostic.

Can a relation exist between the nerve impulse of the interni and certain functions of the retina? If it is due to hyperæsthesia of the retina, and especially that portion that is cognizant of yellow color, why should it yield to prism glasses or to a tenotomy? A solution of this question would be of interest, and might be of great value.

VIENNA MEN AND OPPORTUNITIES.

BY F. B. KELLOGG, M. D., TACOMA, WASH.

It was my good fortune to spend six months of the past year among the clinics of Vienna. The idea of writing them up for the JOURNAL was suggested to me by Dr. French's articles upon eye work in London, which attracted my attention at once upon my return home. They were especially interesting to me, as I had myself after leaving Vienna spent several weeks in the Moorfields clinics, and was fresh from the presence and influence of the men whose work he has described. Without expecting to awaken by the present paper a corresponding interest, it is not impossible that it may be of service to some who may contemplate a pilgrimage to that medical Mecca Vienna, and possibly be of interest to others. It is written throughout with especial reference to the study of the eye, ear, nose, and throat.

And first a word as to the conditions which have given Vienna precedence over any other center as a field for post-graduate study.

Over one hundred years ago, while Vienna was as yet a comparatively small city, the present general hospital was planned upon a scale so extensive that no additions to it were necessary until within a few years, and these, although architecturally more imposing, are insignificant in expanse compared with the original structures. The Royal University, to which this hospital is an annex, holds about the same relation to other Austrian educational institutions that Vienna itself holds to the other towns of the empire,

i. e., it completely overshadows them. The professorships of the medical department are the highest goal of Austrian medical ambition. The result has been the centralization practically under one roof, not only of all the clinical material of Vienna and the surrounding country, but of the most eminent medical and surgical talent of Austria.

This favorable combination has done much to give Vienna its popularity; for, to a visitor who desires to crowd as much work as possible into a few months, the concentration of suitable instruction and clinical material is a consideration of inestimable value. This, together with the system of short courses there in vogue, makes it possible for a visitor to fill his time with selected work, under the best men, almost as soon as he arrives. The courses are from four to six weeks in length, and occupy each an hour daily, often including Saturday. The classes are limited in number. Clinical cases furnish the text for each lecture; and each one is given an opportunity to critically examine each case. In several of the clinics the men are allowed to operate under the supervision of the instructor. Many of the most valuable courses are given by the assistants, many of whom have held their positions for years, and are themselves celebrated.

One of the most important personages connected with the visit of an American to Vienna is a gentleman outside of the profession, the Rev. Francis Gordon, pastor of the Presbyterian Church. His charge is made up largely of English, Scotch, and American doctors and their friends, and Pastor Gordon is a veritable missionary among the English-speaking colony. There is an Anglo-American Medical Association, of which he is the permanent secretary, whose object is to assist newcomers in getting quickly at work. A newcomer applying to Mr. Gordon at 12 Landesgericht Strasse will be at once introduced to some member of a standing committee, whose duty it is to give the stranger all the advice and assistance he can in selecting and securing admission to the best courses.

It is a great mistake to think that a thorough mastery of

German is essential to enable one to profit by the advantages of Vienna. On the other hand, it is a still greater mistake to leave all study of the language until one arrives on the scene of action. One should devote an hour or two daily to the language for several months before going, if possible. If this cannot be done he should go into some interior city of Germany, such as Munich, Hanover, or Dresden, where the cost of living is very low, and board in a German family, avoiding all English-speaking company for a month or six weeks, associating as much as possible with the natives, studying with a teacher, and reading medical German. At the end of this time he can go to Vienna, take a limited number of courses, and continue the study of German in connection with active work. By the end of a month he will be able to understand nearly everything that is said in the clinics. In fact he will have lost very little from the first, for many of the instructors speak English, and these can be selected at the start.

If I have devoted considerable space to the foregoing details it is only from a realizing sense of the unusual advantages to be enjoyed there in the field of specialty work, and a desire to encourage others to profit by them.

Having thus given some general facts regarding the clinics of Vienna, I will proceed to a more detailed consideration of the men and opportunities connected therewith.

In the ocular field the most notable and interesting authority is Fuchs. Formerly assistant to Jaeger and Arlt, their mantle has fallen upon his shoulders, and he is now the chief in the same clinic which gave them the material for achieving fame and advancing the cause of science. Nor could they have had a more worthy successor. Fuchs' treatise upon diseases of the eye ("*Augenheilkunde*") is one of the most, if not *the* most, complete, lucid, and practical work upon that subject. With his large private practice, his lectures to the university students, and his clinical duties he has no time to devote to giving courses, but his lectures are open to all, while his operations in the

wards are always witnessed by an attentive circle, generally made up of English and Americans.

It is impossible to come in contact with this man and not feel for him something deeper than admiration. Endowed with a commanding presence, there is withal a grave dignity which compels respect and attention for his lightest word. In all that he does or says there is a quiet self-possession without a trace of self-sufficiency or consciousness which shows at once the earnest and humble student of science. His operating shows the possession of a rare combination of judgment and skill.

In a subsequent paper I will, if acceptable, give detailed observations of the methods which obtain in this and other clinics, confining myself for the present to a more general view.

Among the many admirable characteristics of Professor Fuchs his consideration for his clinical patients is not the least. No student or visitor is allowed to examine a patient except under the supervision of an assistant, and the idea of regarding such as only "clinical material" is very foreign to the spirit in which the clinic is conducted.

The permanent assistants in this clinic are Salzman, Müller, and Czermack. Dimmer, who holds the position of "docent" or instructor in the University Catalogue, is really second in rank to Fuchs, and conducts a special course upon ophthalmoscopy in connection with this clinic. It is the best course upon that subject, and is rendered more attractive by Dr. Dimmer's ability to speak English fluently, which he is always ready to do upon request. It is a rare ophthalmoscopic case indeed of which Fuchs' clinic is unable to furnish an illustration. Retinoscopy is taught, but in a less satisfactory manner than in London.

Salzman, who is also an artist in a practical way, and is said to have drawn many of the diagrams for Fuchs' book, has done the profession a valuable service in the reproduction in book form of Jaeger's wonderful ophthalmoscopic plates, together with several additional plates of his own and an English translation of the text. Of the labor spent

by Jaeger in the preparation of the originals he speaks as follows in the preface :

“ The exactness with which the pictures have been prepared may be judged by the fact that I copied the direct and indirect image in every case, so as to control by the difference any errors which might arise, as well as by the fact that I generally required twenty to thirty, and even thirty to forty sittings of from two to three hours each to prepare the sketch of the image alone.”

Salzman's reproductions are practically identical with the original, being reduced somewhat in size as well as in price (\$7.50). Their value to an oculist is beyond computation.

Salzman gives an excellent private course in English upon external diseases of the eye, taking his illustrations from the wards.

Czermack is the pathologist of the clinic, and gives a pathological course with the microscope in connection with his work. He is a man of great ability, but lazy, and his course is not what it might and should be.

Müller, the second assistant, gives a private course to the German students, which is also open to foreigners, and is most valuable to one well versed in the language. It was my fortune at one time to be the only foreign member of this class, and it is a pleasure to testify to the especial courtesy of which I was the recipient. These are the only eye clinics of which I can speak from experience, and are, I believe, the best there. Stellwag still conducts a clinic, but it is little frequented. He is very old and infirm, and a clinic always partakes of the character of its chief. I must remark here two facts concerning eye work in Vienna: 1. Much less importance is attached to careful refraction work than in London or America. 2. In hospital practice at least, inequalities of the ocular muscles are entirely ignored.

Refraction is estimated by the trial lenses and the ophthalmoscope, a mydriatic being rarely resorted to. In this field only is London superior to Vienna. In all others—

possibly excepting pathology—the advantages of Vienna are incomparably superior.

The course upon operations, under Bergmeister, is one which alone draws men to Vienna from almost every country. Each member of the class is required to operate upon the phantom, under his critical supervision. At least three times a week all typical operations upon the lids are done upon the human subject. It is a drill of incalculable value to an oculist.

The limits of this paper will necessitate leaving the consideration of the ear and throat clinics for a future time. I will say briefly, however, that with the exception of the course just mentioned they are even more attractive and profitable than those upon the eye.

NOTE.—While there is no doubt that the clinics of Europe are excellent in certain lines, the American physician is too apt to forget that it is no longer necessary to leave his own country to obtain a sound training in the treatment of diseases of the eye, ear, and throat. Although surpassed in some respects by certain institutions of the old world, the College of the New York Ophthalmic Hospital offers facilities which in general excellence are equal to those of any of the European hospitals, and in some respects superior. The student too often fails to realize that the one point in which the old world is deficient and in which we excel, viz., the treatment of anomalies of refraction and accommodation, is the very thing which he most needs; that the bulk of his work, at least among refined people, will be in connection with this branch of ophthalmic science; that while he may not see the large number of operations here, he will see enough to satisfy his necessities in this direction; that he will see all of the rare cases here, will learn refraction thoroughly and practically, and at the same time will get a large experience in the use of homeopathic remedies in these conditions which often render unnecessary the operations which are the main reliance of the old school oculist. We have been on the staff of the New

York Ophthalmic Hospital for seventeen years, and during that time have seen many students, and it is our deliberate opinion that a student can get a more thorough practical training in New York than he is likely to find elsewhere.

—ED.

NOTES ON WORD-BLINDNESS AND ITS CON-
COMITANTS. A FRAGMENTARY CONTRI-
BUTION.

BY H. H. CRIPPEN, M. D., AND F. F. CASSEDAY, M. D.

(Concluded from page 100.)

CASE. XIV.

Reporter.—Bernheim.

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Alexia. Agraphia.
Impairment of power of recognizing objects.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Softening within occipital lobe, also occipital gyri
and angular gyrus.

Remarks.—This patient was left-handed and the lesion was
found in the right hemisphere.

CASE XV.

Reporter.—Laquer.

General Paralytic Symptoms.—None

Affections of the Mental Faculties.—Impairment of
power to recognize objects seen. Alexia. Impairment of
speech. Talked jargon.

Symptoms Relating to the Eyes.—None.

Result.—Death.

Autopsy.—Softening in temporal gyri, in inferior parietal and
supra-marginal gyrus, and in occipital gyri.

CASE XVI.

Reporter.—Broadbent (from Skwortzoff, *op. cit.*).

General Paralytic Symptoms.—None.

Affections of the Mental Faculties.—Loss of ability to
read written or printed words, (except proper name of the subject).
Impossibility to recall the names of even the most familiar objects.

Symptoms Relating to the Eyes.—None.

Result.—Death from apoplexy.

Autopsy.—Extensive atheroma of cerebral vessels. Old clots in the left hemisphere, with softening of the cerebral substance situated external to the lateral ventricle at its union with the sphenoidal prolongation. Recent hemorrhage in the same locality.

Remarks.—Symptoms first appeared after an acute cerebral attack.

CASE XVII.

Reporter.—Magnan (from Skwartzoff, *op. cit.*).

General Paralytic Symptoms.—Right hemiplegia.

Affections of the Mental Faculties.—Aphasia. Logoplegia. Incomplete blindness for words. Conservation of tonal image.

Symptoms Relating to the Eyes.—None.

Result.—Coma. Death.

Autopsy.—Atheroma of the cerebral arteries; thickening of the dura mater. In left hemisphere extensive softening occupying the occipital and sphenoidal lobes, and terminating at the root of the superior and inferior parietal lobes. Small amount of softening at the foot of the second frontal convolution. The whole of the pedicle of the third frontal was dotted with very small foci of softening.

In the right hemisphere, a small focus of softening on the inferior face of the frontal lobe, external to the second orbital convolution. Another the size of a pea at the foot of the second frontal. At the posterior part of the superior parietal lobe, at one centimeter above the external perpendicular fissure, was a plaque of softening affecting the whole thickness of the cortex.

Remarks.—The atheroma was general, the heart being fatty, with atheromatous degeneration of the mitral valve and of the aorta.

CASE XVIII.

Reporter.—Déjerine (Skwartzoff, *op. cit.*).

General Paralytic Symptoms.—Paralytic disturbance of speech. Hemiplegia and hemianæsthesia of right side.

Affections of the Mental Faculties.—Aphasia. Logoplegia. Incomplete blindness for words.

Symptoms Relating to the Eyes.—None.

Result.—Coma. Death.

Autopsy.—Sarcoma of left inferior parietal lobe, penetrating into the superior parietal and into the sphenoidal.

Remarks.—In this case the aphasic symptoms were intermittent.

Six Cases of Pure Word-Blindness without Apraxia.—Authors are: 1, Broadbent; 2, Jastrowitz; 3, Henschen; 4, Hun; 5, Wilbrand; 6, Sigaud.

Power to recognize objects in all cases was good. Power to read was lost in the first five, good in the last. Power to write was good in the first, lost in the fourth, never learned in the fifth, and lost from lack of power to recall appearance of words in the sixth.

Power to understand speech was impaired in the third but good in all others. Power to speak good in the first two and last two, slightly impaired in the fourth. Lesion softening in all locations of the left hemisphere. First case under temporal gyri and angular gyrus. Second case, occipital gyri lobe. Third case, angular gyrus. Fourth case, posterior central, superior parietal, inferior parietal, including supramarginal gyrus, angular gyrus. Fifth case, within temporal gyri, occipital gyri lobe. Sixth case, inferior parietal, including supramarginal gyrus, angular gyrus.

The above *résumé*, prepared by Dr. M. Allen Starr,* contains only cases of pure word-blindness, and for that reason we give it separately in place of including it with our analysis of mixed conditions. It is interesting to note that Dr. Starr uses the title of "Cases of Pure Word-Blindness without Apraxia," for it has seemed to us that the definition of the term apraxia (loss of memory of the nature and the uses of surrounding objects) included word-blindness, or loss of memory-pictures of letters and words, just as deafness of mind implies loss of memory of sound.

Besides these fragmentary notes, let us consider some points which are of practical interest.

Skwartzoff, in concluding a work on word-blindness, says: "We believe that the number of cases of blindness for words that we have cited are extensive enough to allow us

* *Op. cit.*

to affirm that this disorder very often accompanies disturbances of speech. The cases where it accompanies agraphia are still more frequent, but when the latter is complete blindness for words is less easy to appreciate. To this category belongs all aphasics who lose at the same time speech, writing, and reading."

Thus comprised, word-blindness becomes a common fact. On the other hand, it is important not to confuse blindness for words with hemianopsia accompanied by aphasia. Hemiopes can see and read when the image of the letters falls on the intact part of the retina; thus of two words placed side by side they read and comprehend one and are incapable of reading the other. In the street they read while passing signs that they cannot read when fixing them. With regard to long words they read one part without being able to distinguish the other. Cases of this kind are related by Galezowski,* Wernicke,† Bernhardt,‡ Fürstner,§ Reinhardt,|| etc. In that of Westphal hemianopsia coexisted with word-blindness.

Word-blindness may be confused with that form of aphasia which bears the improper name of ataxic aphasia. These subjects can sometimes write, but are incapable of good articulation of words and of reading that which they have written themselves, like the patient of Martinet which we have seen cited more than once by the side of the cases of Winslow and Trousseau¶ as types of word-blindness. To avoid this error it is sufficient to ask the patient to turn the page while another person reads aloud or to have him indicate the passage or word which has been read, etc.

The knowledge of word-blindness is very important for medical jurisprudence. Suppose we have an aphasic, as in a case by Magnan, with complete word-blindness, but not agraphic, who makes his will, puts in the date, etc., and who

* *Arch. gen. de med.*, 1866, p. 641.

† "Der aphasische symptom complex." Breslau, 1874.

‡ *Berlin kl. Wochenschr.* 1872, No. 32.

§ *Arch. f. Psych.*, 1878.

|| *Arch. f. Psych.*, 1879.

¶ Skwartzoff, *Op. cit.*

dies. What shall be said of this testament so well written by one who cannot read?

Seven cases, one reported by Monakow in the *Archiv f. Psych.*, and the other six by Henry Hun, M. D., of Albany, N. Y. (*Albany Med. Annals*, January, 1887), afford some interesting studies in cerebral localization, and in the differential diagnosis of word-blindness. Case I., by Hun, showed defects in the fields of vision involving the lower left quadrant of each. Atrophy of the lower half of the right cuneus. Patient complained of mental confusion or disturbance of vision, nervous memory, weak for names. He slept but little. Blindness limited to the lower left quadrant of the field of vision of each eye.

From the study of the hemianopsia here made by Hun the following deductions may be drawn.

1. The optic fibers from the right upper quadrant of each retina terminate in the lower half of the right cuneus.

2. The optic fibers from the right lower quadrant of each retina terminate in the adjacent part of the right median occipito-temporal convolution.

3. The lower half of the cuneus and the adjacent part of the median occipito-temporal convolution is the point of termination of the optic nerves from the homonymous halves of the retina, the right half of each retina being represented in the right occipital lobe and the left half in the left lobe.

4. On the median surface of the occipital lobe take place those actions which are associated with simple visual sensations.

5. On the convex surface of the (left ?) occipital lobe take place actions which are associated with complete visual perception and recognition.

CASE II. In this case there was inability to understand spoken words, and in consequence symptoms of sensory aphasia—that is, the patient not understanding what is said to him, makes irrelevant remarks, and if by any chance he uses the wrong word, he cannot correct himself by the sense of hearing. The memory of spoken words depends upon the integrity of the left superior temporal convolution, and

the full perception and recognition of spoken words are associated with actions taking place in that portion of the cortex. In addition to this when the whole temporal lobe or the bundle of fibers which runs from the internal capsule to the temporal lobe is destroyed, there results not merely inability to understand spoken words, but complete deafness. In Case III. there was impairment of motion and sensation in right arm and leg, agraphia, alexia, and aphasia. Atrophy of lower three-quarters of posterior central convolution, and of the inferior parietal lobule of the left cerebral hemisphere. This patient could not spell, read, or write. He could not spell the simplest word from memory. The sign "John Kingsbury" was opposite his house. He would speak out the word "John" by sight, then close his eyes and try in vain to spell it from memory. He understood what was said to him.

The principal convolutions involved in the atrophy in this case were the posterior central, except a small portion of it near the longitudinal fissure, the supramarginal convolution, and the greater part of the angular convolution of the left cerebral hemisphere. This case is of interest in a negative way, inasmuch as this extensive lesion caused no disturbance of sight or hearing. Case II. showed us that the memories of things seen depends upon the integrity of the convex surface of the left occipital lobe, and that the memories of spoken words depends upon the integrity of the left superior temporal convolution. Case III. shows that these centers cannot encroach to any extent upon the parietal lobe, as it is sometimes claimed that they do. It is also one of the cases which show that the cortical center for sight is not situated in the angular convolution, as Ferrier concluded it was from his experiments upon apes. The other cases do not afford us any particular light upon this subject.

Armaignac (*Recueil d'ophtalmologie*, November, 1883) reports a very interesting case of complete aphasia with right hemiplegia and hemiopia, and agraphia; cure of the paralysis and return of speech, but persistence of the hemiopia,

agraphia, and word-blindness. Patient was a man aged sixty-six. Patient awoke one morning with complete hemiplegia on right side, and entire loss of power of speech. After two months paralysis began to disappear and four months later the patient had entirely recovered the use of his limbs. He was still dumb and could not perform any manual labor. After two years and a half he suddenly regained his speech. Four years after the trouble began his intellectual faculties were apparently normal, but his writing was childish, and he did not recognize a single letter. He has never forgotten figures and can read them and make calculations mentally. He recognizes all colors.

From a purely clinical standpoint this case produces a strong belief that the motor center for the leg and arm of the right side, the centers for articulate speech, for the memory of words and names, and finally for vision in the right half of the visual field are situated close to one another.

Huguenin's case of softening with aphasia, alexia, deafness, and death (*Klin. monatsbl. f. Augenheilk.*, 1882, S. 141) was referred to by Henry Hun in his article, but the details of the case are not accessible to us.

Luciani asserts very positively that in monkeys and dogs where both occipital lobes are extirpated the result is a temporary blindness, followed by psychical blindness, *i. e.*, a condition in which the animal sees objects, but does not appreciate their nature. It sensates but does not perceive. Hence these sensory cortical areas are centers for visual perceptions. In their destruction there is lost the memory of previous sensations and the power of associating them, just as after the destruction of the cortical motor centers there is lost the memory of the association of movements, the animals recovering from complete paralysis, but moving in a clumsy and unintelligent way (Goltz).

Munk's investigations and experiments upon animals, reported to the Physiological Society of Berlin in the years 1877-80, furnish further evidence upon cerebral localization, especially of the centers for vision. He removed circular segments, fifteen millimeters in diameter and about two

millimeters in depth, from the convexity of the brain (of dogs) in various localities. Only when the part removed was in a limited area of the occipital region was there any appreciable impairment of vision. The vision was affected only in the eye opposite the injured hemisphere. When the sound eye was covered so that he could only use the affected one, or, in case a symmetrical lesion had been produced in both hemispheres, when both eyes were uncovered, it was observed that the animal no longer recognized objects formerly familiar to him. Yet the dog was not blind, for he avoided obstacles in his way. At the end of from four to six weeks this visual defect gradually disappeared, and objects were recognized as before.

Munk supposed that the removal of this area in the cortex did not produce blindness, but that it robbed the brain of that part wherein were stored the visual images gained from past experience, leaving the animals, therefore, like newborn, who see, but do not know the meaning of what they see. The fact that they again recognized objects after the lapse of a few weeks he attributed to knowledge gained from new experience. He terms this failure to recognize objects formerly familiar "soul-blindness," from the German (*seelenblindheit*).

Dr. Phillip Zenner (*Medical Record*, September 27, 1884) in closing a paper on "Cerebral Localization," says: "We have seen that all points alike to the presence of center for vision in the cortex of the posterior portion of the hemispheres." "It may be that other parts of the brain are in some manner connected with the sense of vision, for the subject is not entirely cleared up. But it must be accepted as an acquired fact in anthropological science that the sense of vision is intimately connected with a limited portion of the cerebral cortex."

Mauthner (*Gehirn und Auge*, p. 487) believes that Munk's soul-blindness is altogether due to impaired vision, that his dogs do not recognize objects because they do not see distinctly, and that the effects would be altogether the same whether the central parts of the retinae or the central parts

of the visual areas were destroyed. The difference between these views should be distinctly recognized. Mauthner also believes that the retained visual images reside in the cortex, but he believes that the seat of these images is coextensive with vision itself, whereas Munk believes that while the whole visual area is devoted to vision, some images are stored up, retained or memorized in one part of it, some in other parts, and that such images may therefore be lost, while the sense of vision is retained.

A few years ago Fürstner first reported such cases (word-blindness). In Fürstner's first case, after an epileptiform seizure with loss of consciousness, a right hemiplegia of several days' duration was found, also a deviation of the eyes to the left, which was of two weeks' duration. A few weeks after this seizure, when the mind was completely clear, it was observed that the patient recognized objects with the left eye, but did not appear to see with the right one. His vision improved, and it was now noted that when he tried to grasp an object in the hand of the physician he moved his head from side to side, then seizing the arm of the physician, followed it until he reached the hand. He could not count objects without touching them. Often in attempting to touch objects he reached beyond them. In counting small objects he often overlooked some or counted the same one repeatedly. In counting he would move his head from side to side. At a later period he could recognize small letters, but if the letters were combined to form a word he could neither read the word nor point out the separate letters. The patient's mind was quite clear and he was repeatedly and carefully examined. It was explicitly stated that there was neither color blindness, contraction of the field of vision, hemianopia, nor binocular diplopia. These visual disturbances almost disappeared, when the patient had other paralytic attacks and died shortly afterward. A focus of softening was found in each occipital lobe. Fürstner observed similar visual disturbances in other cases, always following paralytic attacks.

Stenger (*Archiv f. Psychiatrie*, xiii. p. 225) reports some cases where the visual symptoms were even more peculiar.

Two of his cases are especially interesting. In the first case, in whom there was already a degree of dementia, there occurred paralytic attacks every four or six weeks, with some elevation of temperature and convulsions, chiefly on the right side, followed by transient hemiplegia. Following each attack there were disturbances of speech, with word-deafness and the peculiar visual disturbances we are about to mention. The patient could see a chair which was in his way, but only avoided it after having once stumbled over it. Fire brought close to his eye did not frighten him. He touched it to find out what it was, and only then avoided it. He could see wine but seemed not to know its use until it was brought to his lips. In Stegner's other case the patient recognized his bed, fire, and bread, but not a needle, shoes, or his clothes. Ability to recognize words not stated.

Dr. M. Allen Starr (*Amer. Jour. Med. Sciences*, January, 1884), in summing up the facts regarding the cortical area governing vision, concludes as follows: A study of the cases (thirty-two) cited leads to the inevitable conclusion that the visual area lies in the occipital region, that the symptoms other than visual cannot be referred to any lesion except to that of the occipital lobe, and that the right occipital lobe receives impressions from the right half of both eyes, and the left occipital lobe from the left of both eyes.

In the case reported by Jastrowitz (*Centralblatt f. prakt. Augenheilkunde*, December, 1877, vol i., p. 254), a tumor in the left occipital lobe involving the precuneus resulted in right hemianopsia, and aphasia with inability to read or write.

Mr. Richard Williams of Liverpool described a case (*London Lancet*, November 29, 1890, p. 1164) of alexia occurring in a man aged fifty-seven. He could see the words distinctly but appeared as if beginning to read, and could make no sense of them. He wrote readily from dictation, but could not afterward read what he had written. After he had written part of a letter spontaneously he was unable

to read it, though he could recall the sense. Memory was somewhat defective, and he was more emotional than usual, but could say names of surrounding objects without difficulty. The field of vision presented the character of right homonymous hemianopsia, the blind line reaching to within ten degrees of the point of fixation. Otherwise the appearance of eyes was normal. Improvement was slow and complete.

Finally, on diagnosis, we may say in brief that:

Alexia, pure and simple, rarely exists alone; it is frequently associated with disturbances of speech, agraphia, and hemianopsia accompanied by aphasia.

Alexia should be carefully differentiated from what is known as ataxic aphasia. To avoid this ask the patient to turn the page while another person reads aloud, or have the patient indicate the passage or word which has been read.

Mild cases of insanity are liable in some instances to be mistaken for alexia. Care should be exercised in accepting the word of such patients, as it would for obvious reasons be unreliable.

When hemianopsia is associated with aphasia, alexia, and more or less complete hemiplegia and hemianæsthesia, we may look for extensive occlusion of the cerebral arteries, especially of the left middle cerebral.

Concerning treatment, it is probable that the remedies which have been found of use in other varieties of apraxia will apply here. In one case which we have cited from Armaignac, the recovery of the power of reading was obtained by the patient being taught, like a child, to put letters together to form words. We believe that there are other cases on record in which similar methods have met with success. At the June meeting of the Société de Biologie of Paris, J. B. Charcot described "an apparatus designed to correct verbal blindness." His full report will be found in *Le Progrès Médical*, No. 25, 1892. Unfortunately, we have been unable to obtain access to this report in the preparation of this article, and of necessity are obliged to limit ourselves to a mere reference.

BOOK REVIEWS.

TEXT-BOOK OF OPHTHALMOLOGY. By Dr. ERNEST FUCHS, Professor of Ophthalmology in the University of Vienna. Authorized translation from the second enlarged and improved German edition. By A. DUANE, M. D., Assistant Surgeon Ophthalmic and Aural Institute, New York. Pp. 788. New York : D. Appleton & Co., 1892.

As might be expected from the reputation of the author, this is a thoroughly scientific work, which will at once take a position in the front rank of our ophthalmic literature. In many respects it is the best treatise on the subject in the English language. In its precision and accuracy of statement it reminds us of Stellwag, though much less prolix and possessing a much more readable and pleasing style. It is not a mere rehash of authorities, but bears the impress of the individuality of the author, who does not hesitate to differ with recognized theories in support of his own opinions ; he even corrects our methods of spelling, as in his substitute of the word chorioid for choroid, miosis for myosis, and myoidesopia for myodesopia, claiming that his rendering of the orthography is supported by the Greek origin of the words.

A full but concise summary of the anatomy of each part precedes the description of its diseases, the only exception being that of the retina, in which the author only gives the coarse anatomy, and refers us to the text-books on the subject for the microscopic portion, an omission which in our opinion is much to be regretted as detracting from the completeness of the work. The chapters on the conjunctiva and cornea are well written, clear, and up to date. The author leaves tradition behind him in considering trachoma by taking follicular conjunctivitis out of the category entirely and placing it among the catarrhs. His explanation of this and many other things is given in smaller type than the running text, and the reader will find in this small type

all through the book a mine of valuable information on many points which are scarcely considered in the majority of our text-books, and the lack of which has made us regret more than once that Stellwag was out of date.

In the consideration of iritis the serous variety is omitted, being placed under diseases of the ciliary body as "simple cyclitis."

The anatomy of the choroid is given very simply, the mixture of names which confuse students being left out, and the plain fact stated that the choroid consists mainly of three layers of vessels, large, medium, and small; the lymph spaces are described separately and intelligibly. There is a short chapter on development of the eye, and a concise but excellent description of color blindness.

In our opinion the weak point of the book lies in the fact that retinitis is not treated fully enough. The various forms of disease of the membrane are considered, but in an abridged form which will hardly be satisfactory to the student.

In diseases of the optic nerve the author evidently leans to the old theory of choked disk, in which the papilla is strangled by fluid from the cerebral cavity. It is hinted that there are other theories, but Deutschmann is not mentioned.

The chapters on muscular anomalies are very complete from the German point of view. Of course the theories of Stevens are left out. In this and other parts of the book are many schematic illustrations, which help out the text in a marked degree. Throughout the work the illustrations and press work are excellent.

Of course the book, like all others, has its weak spots, but they are few in comparison with most of its compeers, and we commend it to all our readers as something they cannot afford to be without.

A COMPENDIUM OF MATERIA MEDICA, THERAPEUTICS, AND REPERTORY OF THE DIGESTIVE SYSTEM. By ARKELL ROGER McMICHAEL, M. D. Philadelphia: Boericke & Tafel, 1892. Part I—Stomach, Appetite, Thirst, Taste, Tongue, Mouth, Teeth, Nausea, Vomiting, Eructations, and Flatulence. Part II—Stool, Rectum, Anus, Abdomen, Hypochondria, Umbilicus, and Hypogastrium. Two parts in one volume. Pp. 359.

This is the first volume of a series, each part of which will be complete in itself, the whole forming a comprehensive system of

homeopathic materia medica and therapeutics, with the addition of a voluminous and most excellent repertory.

Each part is divided into two sections, of which the first gives the symptoms of the various drugs and the second a repertory of those symptoms.

The arrangement is new and exceedingly practical. Each page of the first section is divided into four columns, and to each remedy is given the eight columns across the double page. Each column is numbered, and its caption and number are printed at the top, those of part first being : 1, Stomach ; 2, Appetite and Thirst ; 3, Taste and Tongue ; 4, Concomitants ; 5, Mouth and Teeth ; 6, Nausea and Vomiting ; 7, Eructations and Flatulence. The eighth column is headed "Clinical," and in it are given the clinical symptoms for which the remedy has been found useful. In the first seven columns are placed the symptoms of the materia medica properly coming under the various captions.

The drugs follow each other in alphabetical order down the pages, and each drug reads through the eight columns across the double page.

By this arrangement a comparison of the symptoms of the various drugs under any particular heading, the stomach, for instance, can be made very rapidly by simply glancing down the proper column, and the selection of the proper drug for a given case can be made with the greatest facility.

In the repertory the symptoms are arranged in alphabetical order, each symptom being given complete as it appears in the materia medica, and each prominent word in a symptom being placed at the head in its proper alphabetical position, so that, "for instance, the symptom 'Rumbling in abdomen with emission of much offensive flatus' may be found by turning to the words Rumbling, Abdomen, Emission, Offensive, or Flatus, the symptom in full following each caption." After the name of the remedy is placed the number of the column in which the symptom appears in the first section, except where the symptom is from the eighth or clinical column, when the abbreviation "clin." appears instead.

No symptoms are admitted except such as have been verified by cures, and these are divided into "grand characteristics," printed throughout the work in bold face type, and "characteristics," printed in ordinary type.

The work is clear, concise, thoroughly systematic, and eminently practical, and will at once place the author in the front rank of writers on the subject.

To the practitioner it will be a veritable godsend, which will be appreciated on sight, and which can be used on the instant with the same facility as a dictionary.

We await with interest and impatience the coming of the parts containing the symptoms referring to the eye, ear, and throat.

The volume is gotten up in the usual excellent style of the house from which it emanates, and is printed on good paper, with clear, sharp type.

OPHTHALMIC DISEASES AND THERAPEUTICS. By A. B. NORTON, M. D. With fifty-three illustrations and twelve chromo-lithographic figures. Philadelphia : Boericke & Tafel, 1892.

This book is, in effect, the third edition of the well-known "Ophthalmic Therapeutics," the first edition having been prepared by Drs. Allen and Norton, and the second by the late Dr. Geo. S. Norton alone.

The present work was partly written by our lamented friend, and has been made ready for publication by his brother, Dr. A. B. Norton.

In the present edition a short description of the various diseases of the eye precedes the symptoms of the remedies to be used for their treatment, the last third of the work being devoted to the ophthalmic materia medica proper, each remedy being taken in turn, and the symptoms relating to the eye being presented at length.

In the portion devoted to therapeutics new drugs have been introduced, and certain changes have been made in some of the old ones. The arrangement has also been changed somewhat.

The description of the diseases and the *résumé* of the anatomy of the several parts are clearly and concisely written, and present the subjects in a readable manner. To the specialist this part of the work will be of little interest, as it consists of facts which are well known to all oculists, but the student and general practitioner will appreciate the possibility of picking out a few necessary and important points without wading through a mass which does not interest him.

The work is not intended as a complete manual of ophthal-

mology, but simply aims to present the symptoms of the various diseases for which remedies are appended.

For this reason, probably, many subjects usually found in such works are here omitted, as optics, refraction and accommodation, and a number of other important matters, the absence of which under other circumstances would be inexplicable.

The work has some faults which are grave, but when we consider the divided responsibility of its authorship and its many good points they can be passed over in silence.

DISEASES OF THE CHEST, THROAT, AND NASAL CAVITIES, including Physical Diagnosis and Diseases of the Lungs, Heart, and Aorta, Laryngology and Diseases of the Pharynx, Larynx, Nose, Thyroid Gland, and Œsophagus. By E. FLETCHER INGALS, A. M., M. D., Professor of Laryngology and Practice of Medicine, Rush Medical College; Professor of the Throat and Chest, Northwestern University Woman's Medical School; Professor of Laryngology and Rhinology, Chicago Polyclinic; Laryngologist to the St. Joseph's Hospital and to the Presbyterian Hospital, etc.; Fellow of the American Laryngological Association and American Climatological Association; Member of the American Medical Association, Illinois State Medical Society, Chicago Medical Society, Chicago Pathological Society, etc., etc. Second edition, revised and enlarged, with 240 illustrations. New York: William Wood & Co., 1892.

"Diseases of the Chest" occupy 262 of the 675 pages; but as these affections do not directly concern the interests of this JOURNAL, they will not be considered in this review.

In the opening portion of "Diseases of the Throat" is given a very practical *résumé* of the methods of examination of the pharynx, larynx, trachea, and nose, together with the various means of overcoming the obstacles to such examinations. A clear and unusually extended consideration is given of "Chronic Rheumatic Sore Throat," of which Dr. Ingals seems to have given the first account, 1887. No distinction has been made between "Simple Membranous Sore Throat," "Herpetic Sore Throat," and "Aphthous Sore Throat"; further, "Chronic Follicular Pharyngitis" and "Hospital Sore Throat" are given as synonymous terms. These seem strange statements in the light of most medical literature. "Clergyman's Sore Throat" has been considered under three headings, namely, hypertrophic, atrophic, and exudative.

Diphtheria is looked upon by our author "as a constitutional disease with local manifestations," thus adding extra weight to the clinical teaching as contrasted with purely unilateral pathology. In consideration of the glowing success which many writers claim for tracheotomy and intubation in the treatment of secondary laryngeal diphtheria, it is really refreshing to see Ingals' calm statement: "When the larynx is involved it is probable that without surgical interference the mortality reaches ninety-five per cent., and with it about sixty per cent." Even these figures seem out of proportion, ninety per cent. better representing the former and eighty per cent. the latter.

Confusion is apt to arise from the fact that under Chronic Laryngitis—*synonyms*, chronic catarrh of the larynx, laryngitis chronica—we find the following: ". . . the epiglottis or one or both arytenoids may be thickened from twenty to fifty per cent." Such hypertrophic changes are illustrated under the title "Chronic Catarrhal Laryngitis." In considering "Membranous Croup" Dr. Ingals says: "Mackenzie and some other authors, together with a large number of the profession, believe it identical in nature with diphtheria; but I am convinced that these are two distinct diseases." The arguments and statements used, however, are scarcely sufficient to convince the unbiased reader of the dual nature of these (this?) affections. In collections of pus in the larynx the author recommends that, "when the abscess can be reached, the pus should be evacuated by means of the laryngeal lancet." Thus it would seem that, no matter what the size of the abscess, no preliminary (safety) tracheotomy is performed; this appears dangerous in large abscesses.

Although we cannot agree that "all medicinal means have proved inefficient in checking the onward progress of the disease" (cancer of the larynx), it is a gratification to see that the doctor does not advise cauterization, believing that it will do more harm than good.

Intumescent (turgescient) rhinitis has received separate consideration, and the description of this form of chronic rhinitis is the clearest with which we are acquainted. The author has not found it necessary, in any case of post-nasal fibroid, to resort to the more formidable operations of Rougé, Langenbeck, Oliver, etc., preferring the more conservative methods; for example,

electrolysis and the snare. Throughout the work this same conservative idea seems to be paramount, thus making the book of great value to the general practitioner, to whom we gladly commend it as a practical aid to his daily practice.

We have given this extended notice of the so-called second edition, but which is in reality a new work, since the nose and throat portion has been entirely rewritten.

THE MASTOID OPERATION, including its History, Anatomy, and Pathology. By SAMUEL ELLSWORTH ALLEN, M. D. Cloth, \$1.25. Cincinnati: Robert Clarke & Co., 1892.

In this little book of 111 pages will be found the most concise, practical and interesting account of the mastoid operation with which we are acquainted. In the preface the author in a sense apologizes for his work, but an apology is not necessary, and he is to be congratulated for the amount of solid and valuable information which he has compressed in such a small space.

The work consists of four divisions, 1 Historical, 2 Anatomical, 3 Pathological, 4 The Operation. The first gives the history of the surgical treatment of mastoid disease from its inception. The second consists of an excellent description of the anatomy of the parts concerned preparatory to the accurate and well written summary of the pathology of the disease found in chapter III.

The fourth division is devoted to a clear, practical, terse account of the method of operating, giving careful directions for each step and accurate rules for the guidance of the surgeon.

The author was a pupil of Schwartze, and his book exemplifies the methods of that eminent teacher. The work is illustrated by six fine plates and four diagrammatic cuts, is well printed on fine calendered paper and handsomely bound. It should be read by all interested in this branch of surgery.

ITEMS.

We are in receipt of a personal letter from Dr. O. Parisotti of Rome, asking for any assistance that THE JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY, AND LARYNGOLOGY may be able to give toward assuring the success of the International Medical Congress, which meets in Rome, Italy, October 1, 1893. Dr. Parisotti is secretary of the section of ophthalmology, and we shall take great pleasure in forwarding to his address the titles of any papers which our readers may desire incorporated in the programme of the congress; or they may be sent direct to Dr. O. Parisotti, Via Arenula 27, Roma, Italy.

Drs. A. B. Norton and Geo. A. Shepard have removed to No. 16 West Forty-fifth Street, New York.

Dr. H. H. Crippen has been elected a member of the Société d'Ophtalmologie Française, being one of the three members from the United States.

Dr. C. H. Helfrich has resigned his position of house surgeon to the New York Ophthalmic Hospital and has been appointed surgeon to the hospital. He is now located at 136 West Forty-eighth Street, New York, and will devote himself to the treatment of diseases of the eye and ear exclusively.

Dr. C. S. Middleton, Jr., formerly with Dr. Horace F. Ivins of Philadelphia, has begun practice as an eye and ear specialist at 104 Randolph Building, Memphis, Tenn.

Dr. H. F. Fisher has removed to 800 Church Street, Nashville, Tenn.

THE JOURNAL OF OPHTHALMOLOGY, OTOLOGY AND LARYNGOLOGY.

EDITOR,
CHARLES DEADY, M. D.

ASSOCIATE EDITORS,
H. H. CRIPPEN, M. D.
H. F. IVINS, M. D.

OCULAR REFLEX NEUROSES.

BY JAMES A. CAMPBELL, M. D., ST. LOUIS.

Medical literature of all ages is full of recorded cases of ocular reflex neuroses. In former times they were recorded more as peculiar and not understood phenomena; as curiosities, rather than in a scientific sense admitting of explanation. Each year as conducted experiment and investigation is carried on, and as the nervous, physical, and pschical functions and their intricate relationship are gradually unraveled and become better understood, the curious gives way to the matter of fact, and the former phenomena to natural and fairly well understood laws.

The subject is very extensive and far reaching. We have neither time nor space to attempt exhaustive treatment. Ours is a duty to schedule and classify; to record action and reaction; to collect authentic cases of every possible variety, and from this maze and aggregation endeavor to deduce, in the future, some general and well established laws.

Definition.—Nerve reflex is a direct transference of centripetal excitations to centrifugal paths, or vice versa, without the co-operation of the will.

All animal activity and functional force depend upon and are the result of physiological reflex action, whose general laws and pathways are understood.

The reflex is physiological as long as it is in harmony with normal functions and activities.

When the reflex excitations result either in over or under activity, it then becomes an abnormal reflex, or a neurosis.

Physiological reflex action, as well as reflex neurosis, may be manifested either as motor, sensor, or functional phenomena.

The contraction of the pupil to light is an example of physiological reflex; here impression is conveyed by the nerves of special sense (retina and optic nerve) to the brain centers, and then reflected back through a motor nerve (third nerve), producing contraction of the pupil. Or the sight of a disgusting object may produce nausea; here the pathway of the nervous reflex is through the same nerve of special sense to the pneumogastric, and hence the consequent nausea, a neurosis. Or the fluttering, increased rapidity of the heart beat; or the blanching of the cheeks, in the presence of great danger, will again represent the functional features of a reflex neurosis.

The fact that these nerve impulses, originating in one system of nerves, may be transmitted to another system and reflected back again, from sensor to motor or functional, presupposes a close connection and intimate correlation between the cerebro-spinal and the sympathetic systems of nerves. Such intimate relationship and blending are anatomical and physiological facts.

The great sympathetic system of nerves is a series of closely connected ganglia, extending along each side of the spinal column, from the head to the coccyx, communicating with itself from side to side, as well as with both roots of the spinal cord as they emerge. It communicates likewise with all the other nerves of the body, uniting with the fourth and sixth nerves, in the cavernous sinus; and with the olfactory and auditory at their ultimate expansion, as well as being in close connection with all the other cranial nerves, through their cranial ganglia; forming thus the great blending and binding pathway and influence; while at the summit of the spinal cord is the medulla oblongata, a con-

gregation of ganglionic centers, and series of sensory ganglia from which arise the seventh, eighth, ninth, tenth, eleventh and twelfth nerves; and also gives root to fibers of all the remaining six cranial nerves in its center, the fourth ventricle. In addition to this, it is united by commissural bands to all parts of the brain proper, and contains most of the fibers, which are distributed to the other parts of the encephalon; and hence it transmits both the motor and sensory impulses, as they pass from and enter the cerebrum.

In the light of this intimate blending and interpenetration of the cerebro-spinal and sympathetic systems of nerves, their mutual influence, one upon the other, would seem to be not phenomenal, but almost an anatomical and physiological necessity.

Since the normal processes and pathways of reflection are so numerous and complex, it is easily intelligible how numerous and complicated the disturbances of motility, sensation, and function may be, and from how many different points abnormal influences may be excited and reflected, in motor, sensor, and functional, as well as in psychic centers. The form and character of the neurosis may thus be extremely numerous, and hence the recognition of the primary cause may be not only difficult, but, at times, impossible to locate.

Starting out with the above statements clearly in mind, the discussion of ocular neuroses resolves itself into a simple statement of observed and recorded facts, without the necessity of delay for extended and elucidating argument.

Ocular reflex neuroses may be considered under two general headings.

I. Reflex neuroses from the eyes to and implicating other parts and organs.

II. Reflex neuroses from other parts and organs, affecting the eyes.

These reflex activities may be variously manifested, for the same cause may result either in sensory, motor, functional, or organic disturbances, and there is no known fixed law to determine which it will be; in fact these groups

often present no sharp lines of demarcation, but frequently overlap each other at many points, so that, in certain cases, we meet with symptoms characteristic of two or more groups.

Under the first heading, or reflexes from the eyes producing disturbances in other parts and organs, the most important, and the most frequently met with, are those resulting from optical anomalies, viz., myopia, hyperopia, astigmatism.

Various and distinctly different results may follow from the same apparent cause, such as pains in and about the eyes; headaches; neuralgia; photophobia; nictitation; diplopia; nausea; vertigo; dizziness; restlessness; insomnia, and mental aberrations.

Local inflammations may follow same cause, as conjunctivitis; blepharitis; styes; corneal inflammation or ulceration; retinal hyperæmia or optic nerve congestion, etc. These are all the direct results of irritation produced by eye-strain transmitted through the optic nerve to and through the cerebro-spinal and sympathetic systems of nerves, finding outlet either as a perverted sensation, a motor impulse, or causing functional disturbance and, may be, organic changes in various parts.

Under this heading we must also place heterophoria and its disturbing consequences, for it is not the deviations in direction of the eyes themselves, directly, which cause such unpleasant results, which are almost identical with those caused by optical anomalies, but it is through the resulting lack of visual equilibrium, and the difficulty, or impossibility of forming retinal images and impressions on the necessary "identical points," which is the prime cause of the long list of troubles which may follow in the wake of this lack of muscular equilibrium of the eyes.

If we ask why the same apparent condition may produce such widely different results, we should remember, as before remarked, that the laws of reflex action are not universal. The same irritation, functional or organic, may produce radically different reflexes in different subjects, or

in the same subject at different times, while in other cases the same apparent optical or muscular error does not seem to be attended by the least irritating reflex results. There must be some nervous predisposition existing in the subject afflicted, aside from the local points of irritation. This would seem to be proved by the fact that they in whom reflex troubles are most common are usually of a neurasthenic temperament.

To illustrate this variety of susceptibility coming under my personal observations a few brief cases, which are familiar and numerous, may be given.

A scholarly minister, about fifty, had for years suffered with neuralgic pains in and about the eyes, frequent nausea, nervous prostration, etc. etc.—the familiar picture. $A + .25$ D. c. ax. 90° brought perfect relief and restored health.

In another case, a neurotic boy, age fifteen, had frequent epileptoid attacks, which a -5 D. c. ax. horizontal removed; thus showing the small amount of error producing aggravated results in predisposed neurasthenic subjects.

A typical case, showing an utter lack of susceptibility, may now be examined. A gentleman, age thirty, applied to me for aid in defective vision. He had never seen as well as other people. Had never been subject to headaches, neuralgia, or other signs of reflex irritation: only "could not see well."

Examination showed $V. = \frac{15}{30}$. With $+ 6$ D. s. $\odot + 1.25$ D. c. ax. 45° in R. eye and same combination, with ax. 135° in L. eye, gave him $V. = \frac{15}{15}$. He continues to wear this glass with great physical comfort and personal satisfaction. Under ordinary circumstances we would have expected much nerve reflex irritation to be associated with such an optical condition.

Again, a young lady, eighteen years old, wore a $+ 2$ D. for six or eight years with great relief to former sufferings. At the end of this time she again began to have reflex irritation symptoms, to a very annoying degree. The addition of a $+ .25$ D. c. ax. 90° brought instant and permanent relief; thus showing that the neurasthenic predispo-

sition may be different in the same individual at different times; influenced, no doubt, by other general conditions and nerve irritations, originating at parts other than the eyes.

Under peculiar reflex symptoms may here be mentioned the case of a lady, with myopic astigmatism, who felt a severe pain run down her right leg every time she tried to read more than a few minutes.

In the consideration of the resulting sensory neuroses, above given, as pain, neuralgia, headaches, etc., we should remember, as Erb well states it, that pain is a common sensation that belongs, not to a peculiar kind, but only to a certain degree of sensation; and it thus has no specific quality. It is only a question of intensity; hence pain is but the aggravation of normal sensations; and this is the chief difference between a physiological reflex and an abnormal or reflex neurosis. The sensation of pain depends upon two factors, its intensity and individual susceptibility.

The various forms of reflex neuroses, which may result from optical anomalies, will illustrate the different reflex pathways through which perverted nerve action may be exhibited.

While the attention of the ophthalmologist is principally directed to the various forms of reflex neurosis originating in the eyes, he should carefully keep in mind that, in keeping with the laws of reflex nerve action, irritation of any character, having origin in any organ, or at any part of the body remote or near the eyes, may be transmitted back to, and affect the eyes through the same pathways which the first mentioned efferent neurosis traveled. Indeed many of the most obstinate and annoying cases of eye trouble we meet can only be remedied by the discovery and mastery of the remote causes which produce them. The eye is in a state of responsive sympathy with every organ and region of the body.

Tabes dorsalis or allied diseases are accompanied by contracted pupils and at times by paralysis of the eye muscles. Paresis of the oculo motorius and abducens occurs in the early stages of locomotor ataxia.

In 70 cases of locomotor ataxia reported by Granger Stewart (c. + Med. W. 1882), there were 20 cases of squint; 3 of ptosis; 4 of diplopia, without manifest squint; 7 of myosis; 4 difference in pupillary diameter; 8 with Argyll-Robertson pupil, etc.

On the other hand irritation of the cilio-spinal region will often be associated with partial mydriasis and optic nerve congestion; while paresis or paralysis of the cervical sympathetic will produce myosis, as well as partial ptosis. This is through the sympathetic system of nerves. According to Hensen and Volckers the pupillary fibers of the sympathetic leave the cord at the upper dorsal and lower cervical vertebræ, going through the superior cervical ganglion and entering the carotid plexus. They then pass through the ciliary ganglion, in the orbit. The whole of the fibers do not take this course, because it is found that, when the ciliary ganglion is extirpated, irritation of the trunk of the sympathetic will still dilate the pupil. The ophthalmic branch of the fifth nerve, and probably other nerves connecting with the inner eye, also furnish channels of access for other sympathetic fibers. The partial ptosis is caused by paresis or paralysis of the sympathetic, which sends motor fibers to the musculi palpebrales. This form of partial ptosis is not uncommon in women, and is frequently associated with reflexes from the uterine or ovarian system.

Hystero-neuroses form a special and frequently met with group. It is noteworthy, however, that the severity of the uterine disease does not predicate the presence or absence, the severity or the mildness of the reflex. Authority tells us that structural diseases of the uterus and its appendages are not so apt to be followed by reflex phenomena as are functional troubles.

In his very interesting discussion of "Visual Disturbances and Uterine Diseases," A. Mooren (A. F. A., vol. x.) declares from his large experience that there is no part of the eye which, either from physiological or pathological point of view, is beyond the influence of the uterine system. He assigns the reflex theory as the direct cause.

The suppression of menstruation has frequently produced eye complications. McKay (*Journal Med. Sciences*, 1882) gives twelve cases of ocular affections from suppressed menstruation, numbering among them choked disk, diplopia, asthenopia, defective vision in some, etc.; while M. F. Comes (*Am. Med. Herald*, October, 1882) gives four cases of menstrual amblyopia, varying from slight loss of vision to almost total blindness; deep-seated pains in eyes, with burning, stinging, etc., all of which were restored after menstruation had been re-established.

Sexual excesses, and especially masturbation, are frequent causes of reflex ocular trouble. The latter is a prolific cause of much irritation and it is generally very difficult to trace, especially in females. It is a frequent cause of spasm of the accommodation, hyperæmia of the fundus and optic disk, obstinate neuralgic pains in and about the eyes and, in some cases, paresis of the accommodation.

Connected with hysteria, that general neurosis of the whole nervous system, there are frequent and various forms of eye complications, embracing partial or complete amblyopia, hemiopia, scotoma, phosphenes, floating clouds, myosis, mydriasis, ptosis, photophobia, spasm or paresis of the accommodation, neuralgic pains, etc., etc., all of which are purely reflex ocular neuroses, a part of the general neurosis.

Orificial irritations are frequent causes of reflex troubles. This includes hemorrhoidal and other anal diseases, phimosis, stricture of the urethra, or cervix uteri; all of which are, without question, frequent causes. Recent current medical literature is filled with cases fully illustrating this.

Intestinal irritation, either from inflammation or from worms, has been followed by ocular reactions. Both of these conditions may produce similar eye reflexes, such as temporary strabismus, diplopia, myosis or mydriasis, ptosis or wide open eyelids. Many remarkable cases have been reported from time to time. Lawrence (*Am. Ed.*, 1854, p. 607) gives case of a child seven years old, who had intolerable paroxysms of pain in left eye, recurring at uncertain intervals, without visible changes in the eye, which was en-

tirely relieved by purgatives, bringing away a coral bead, which had been swallowed.

M. Wishart gives a case of complete amaurosis of the left eye, in a boy nine years old, of four months' duration, who made immediate recovery after free purgative.

Another case is given of a boy eight years old, who could not see large print, who was rapidly restored after turpentine enemata brought away quantities of worms.

In a recent case of my own, a young man of twenty-six, who had a very persistent and annoying diplopia, causing vertigo and disagreeable head symptoms, recovered promptly after passing several yards of tape worm.

There are many cases similar to those related on record.

The great trifacial nerve is very intimately connected with all parts of the visual apparatus, both directly and indirectly, through the sympathetic nerves and the ciliary ganglion. From this we might expect that all the necessary conditions to favor frequent and varied forms of ocular reflex neuroses were present; and such is the case.

Many authentic cases of defective vision following irritation of the fifth nerve have been reported. Mackenzie (Am. Ed., 1855, p. 997) gives case of a man who had a small tumor on the crown of the head, which had been ten years coming. It was not painful or sensitive to touch. He had much headache and quite defective vision. It proved to be a cartilaginous cyst, filled with a yellowish fluid. Its removal restored his vision and remedied his headaches.

Within the past year a patient of mine had a tumor size of a filbert, about one-half an inch above the supra-orbital foramen of the left eye. It had been gradually developing for some years, and the vision of that eye had been as gradually growing less and less. The removal of this growth perfectly restored the sight.

Many cases of partial or nearly total loss of vision caused by diseased teeth have been published. I discussed this topic in a contribution, "The Eye-tooth and the Eye" in the *Chicago Medical Investigator* (July, 1875) and gave then the accepted explanation for it, which is that it is a reflex

neurosis through the ciliary ganglion and the other sympathetic connections of the great trifacial nerve. Since then a number of interesting cases have come under my observation. One case is well worthy of comment. A lady had a large cavity in the left upper bicuspid tooth. The diseased contents were thoroughly excavated and removed, and the nerve was killed by a dentist. The tooth was filled with gold. A month or two afterward the vision of the left eye began to fail, growing less and less as the weeks went by. The tooth was not sensitive, but the gum at one side of it seemed painful to pressure. The tooth was extracted, and the sight was rapidly restored. Examination of the tooth showed that, in the filling of it, the thin side wall had been perforated at one point, and a little plug of gold had forced through it, extending about one-tenth of an inch outside, and pressed against the wall of the socket; and this had set up the reflex neurosis, through the well-known pathways, to the seeing nerve.

In the above brief examples of various forms of ocular reflex neurosis, no attempt has been made to explain why the reflexes should be so varied in their nature; why the phenomenon is at one time sensor, at another motor, then functional and again organic; for, as mentioned before, there does not seem to be any known law regulating the direction which the reflex may take. They may thus be manifested as :

I. Sensor.

II. Motor.

III. Functional and

IV. Organic.

Under sensor reflex neuroses may be grouped all forms of abnormal or perverted sensations—hyperæsthesia, anæsthesia.

Under motor reflexes will be included all forms of spasmodic action (tonic, clonic, spastic), paralysis or paresis.

Under functional reflex ocular neuroses will be numbered all interference with the proper nutrition of the eye, or its vaso-motor supply, affecting as a result either the seeing nerve, retina, dioptric media, accommodation apparatus; or the proper support of any of the other eye tissues.

Closely related to this last heading is the reflex neurosis

which may result in organic changes: anæmia, hyperæmia, inflammation, tissue or anatomical changes, hyperplasia, neoplastic formations, degenerative processes, hypertrophy, or atrophy. Eye literature is full of examples of the above statements.

Mackenzie relates a case of a man, age forty-five, with an old discharging ulcer on his leg, which was suppressed by his getting wet. This was followed by blindness in fourteen days afterward. The ulcer was restored, and vision then returned. The same authority tells us that Beer claimed to have cured twenty such amaurotic patients by restoring suppressed ulcerations. Such conditions can only be explained by reflex sympathy from the sentient surfaces to the cerebo-spinal center, transferred to the sympathetic system, and through this to the optic nerves and retinal expansion, or their brain centers.

A. Moore has discussed this question in his paper, "Influence of the Skin and its Diseases upon the Eye."

An important additional heading should be likewise mentioned, which, while distinct from the others, is very markedly influenced by any one or all of the above subdivisions given. It may be introduced under the term psychic, or the influence of ocular neurosis upon the brain centers proper, which may result in illusions, aberrations, chorea, epileptoid seizures, vertigo, and even insanity. Both optical anomalies and heterophoria have been followed by such results.

Experiment has demonstrated that section or paralysis of the cervical sympathetic will be followed by hypotony, and that irritation of the same nerve will produce the reverse effect, hypertony; thus proving conclusively that tension of the eye is largely influenced, if not entirely regulated, by the sympathetic nerve. The well-known fact that the irritation of the fifth nerve may cause increased T. and its paralysis a reduced T., does not disprove it, for this latter effect may be explained by the intimate relationship and reflex blending of these nerves, brought about through the ciliary ganglion. Hence, since it is thus proved that T. of the eyes may be increased by irritation of the sympathetic

nerve, and decreased by its partial or total paralysis, and since the nutrition of the eye itself is largely influenced by the same sympathetic; and finally, since the sympathetic may be irritated by reflex action from other nerves, it would seem reasonable to assume that glaucoma is merely a reflex neurosis, arising from a continued irritation of the sympathetic nerve, connected with the eye, which irritation, as we have seen, may have origin in any part of the body near or remote from the eyes. Indeed the frequency with which we find glaucoma associated with other bodily diseases gives emphasis to this proposition. I have been struck with the frequency of the co-existence of especially rheumatism and similar disorders and glaucoma. It has followed sudden shock, fright, fear, and even joy. The suddenness of its onset, at times again, points strongly to its reflex nervous origin.

Following this same line of thought in the light of the phenomena presented, it is not difficult for me to believe that sympathetic ophthalmia is likewise a reflex neurosis, from a diseased eye to similar and corresponding parts in the other eye. This, to me, seems more reasonable, and in accordance with facts and conditions, than the strained effort to explain it by any microbial meanderings or contagious inflammatory transmission, or through the lymphatics.

In the discussion of this subject I have realized thoroughly its immensity, and the utter impossibility of describing and including all the numerous phenomena connected with it, in the limits of a paper on such an occasion as this. My effort has been to bring out for discussion, in a brief and simple way, some of the most salient points connected with the topic, and to offer a certain few debatable propositions for discussion.

A brief notice of a new book, "The Relation of the Visual Organ and its Diseases to the other Diseases of the Body and its Organs," by Dr. Max Knies, has recently attracted my attention. I very much regret my inability to secure a copy of it, for it is, no doubt, a most valuable contribution to the subject I have endeavored to introduce.

SOME RECENT ADVANCEMENTS IN OTOTOLOGY.*

BY HOWARD P. BELLOWS, M. D., BOSTON, MASS.

The aim of this paper is to pass in review the more notable advancements in otology, in the departments of anatomy, physiology, and bacteriology, during a period of about five years past. In the time allotted little can be done but to summarize, and this mode of treatment leaves little room for criticism and none for originality. It is hoped, however, that the paper will serve its purpose in stimulating discussion, and perhaps, in some instances, encouraging or guiding subsequent reading in some particular direction. To serve this end there will be found appended a very copious reference list of authors and articles.

Anatomy.—In this department of otology the growth of knowledge is of necessity slow, even where the work of several years is scanned. Considerable interest has lately attached to the relative situation and course of the lateral sinus, this being a point of vital importance in the surgery of the mastoid region, and in brain surgery, which is just now so enthusiastically studied with relation to diseases of the ear. This sinus is now believed to follow a higher and more arching course after leaving the occipital protuberance, and before beginning its downward dip behind the meatus, than was previously taught, and also to approach nearer to the meatus in its descent.¹ This changes somewhat the point and method chosen for surgical entrance. To drain the mastoid antrum, for instance, it is recently

* Read before Congress, Chicago, June, 1893.

¹ Birmingham. *Brit. Med. Jour.*, September 20, 1890.

recommended to use a drill, which must not exceed one-fourth inch in diameter, and enter straight in at a point immediately below the level of the upper border of the bony meatus and as close to its posterior wall as possible.

Another point which has apparently been established recently is in regard to the location of the auditory center. This is claimed to be seated in "the posterior third of the first and second temporal convolutions."² The fibers of the auditory nerve from their origin "in the bipolar ganglionic cells of the cochlea and vestibular ganglia,"³ proceed upward to these convolutions and on their way undergo decussation, so that each cerebral hemisphere is supposed to receive impressions from both ears. The only nerve fibers which find their way into the cerebellum are said to be those which arise from the membranous semicircular canals.⁴ This view of the location of the auditory center, for speech at least, is corroborated by the findings of two autopsies, since published, in one of which⁵ a pre-existing deafness on the left side, without apparent disease of the left ear, is thought to have been accounted for by the location of a cerebral tumor upon the right or opposite side of the brain, by which the first temporal convolution had been destroyed and the second somewhat injured; while the second autopsy,² in connection with the previous history of the case, seems to demonstrate, in addition, that total deafness only results when the hearing center is destroyed on both sides of the brain.⁶

Physiology.—Perhaps the most interesting of the physiological questions which have received recent discussion relates to the function of the *tympanic membrane*, which has acquired a new importance within the past year or two. One view advanced⁷ is that its chief function is that of protection of the inter-tympanic structures, its presence

² Mills, *Brain*, January, 1892.

³ *His. Arch. f. Anat. u. Physiol.*, 1890, Supplementary Volume, p. 45.

⁴ Ferrier, *Lancet*, June, 1890.

⁵ Ferguson, *Jour. of Anat. and Physiol.*, January, 1890.

⁶ Manourrier, Soc. d'Anthropologie de Paris, March, 1890.

⁷ Richey, *Trans. Amer. Otol. Soc.*, 1888.

especially guarding the membranes of the round and oval windows and preventing their becoming dry and rigid. The transmission of sound by the drum-head is held to be a function of secondary importance, and the improvement of hearing which often follows an artificial perforation it is believed can be only temporary, because of the absence of the protection which the membrana tympani is designed to afford. Viewed from another, and purely experimental standpoint, the function of the tympanic membrane as a transmitter of vibrations certainly seems to be a most important one. By means of some exceedingly ingenious and skillful experiments upon the cadaver it has recently been demonstrated that if a lateral motion be given to the head of the malleus a corresponding tilting motion is communicated to the foot-plate of the stapes, causing it to move from side to side in the direction of its long axis; and, also, if an outward and inward motion is given to the tympanic membrane and malleus, by means of the pneumatic speculum, a similar motion is perceived in the stapedial plate, which is seen to be drawn outward as well as pushed inward—a point of departure from all previous views. This the experimenter⁸ speaks of as a “piston movement” and he thinks it probable from his experiments that, in some conditions, partial or entire mobility may be restored to the stapes.

This ready response of the stapedial plate to all movements of the tympanic membrane furnishes the latest explanation⁹ of the perception of the direction of sound, since different vibrations are communicated in accordance with the different angle at which sound waves impinge upon the surface of the membrane.

In regard to the mode of regeneration of the tympanic membrane a new fact has been ascertained. There seems to be a difference whether the membrane is newly formed in its entirety, beginning at the tympanic ring, or whether it is merely the repair of a perforation. In the former case

⁸ Larsen, *Archives of Otology*, April, 1892.

⁹ Bonnier, *Comptes Rendues de l'Acad. des Sciences*, October 26, 1891.

it is demonstrated by a recent microscopical examination¹⁰ that the lamina propria is reproduced by fibers, somewhat more dense than normal, which radiate inward from the tympanic ring.¹¹

One of the most original of recent investigations in the physiology of the ear relates to the function of *otoliths*.¹² It being generally conceded that the perception of turning is acquired through the agency of the semicircular canals, it is now shown that perceptions of progressive movement and of position in space may well be furnished by the otolithic apparatus. The vestibule is therefore found to be the organ of what is very aptly called the "static sense." In one series of experiments¹³ the otolith was removed from *ænophores* and subsequent movements watched. These became irregular and without equilibrium. The name "statoliths" is proposed for these substances instead of *otoliths*, because of their newly demonstrated function.

Finally, the *cochlea* has come in for recent investigation with results which are of no little importance. The destruction of this organ, in whole or in part, in forty guinea-pigs has demonstrated¹⁴ that total deafness invariably follows complete destruction of the cochlea, and sometimes follows its partial destruction. It is surmised that perception of the higher notes of the musical scale may occur at the base of the cochlea and the lower tones be perceived at the apex. This view is supported by the result of a recent human autopsy.¹⁵ The patient had exhibited total deafness upon both sides for all sounds except musical notes of low pitch. In the right cochlea were found at the apex a few nerves which were fairly well preserved and Corti's organ in perfect condition.

Bacteriology.—This new field of investigation has already been well cultivated and has been prolific of both facts and

¹⁰ Gomperz, *Monatsschr. f. Ohrenheilk.*, etc., 1892, No. 4.

¹¹ Rumler, *Arch. f. Ohrenheilk.*, vol. xxx. p. 142.

¹² Breuer, *Arch. f. d. ges. Physiol.*, vol. xlviii. pp. 195-306.

¹³ Verworn, Paper on assuming Lectureship, Jena, 1891.

¹⁴ Corradi, *Arch. f. Ohrenheilk.*, 1891, vol. xxxii. p. 1.

¹⁵ Habermann, *Arch. f. Ohrenheilk.*, vol. xxxiii. p. 105.

theories, the practical importance of which the future alone can determine. All portions of the auditory tract, including the eustachian tube, the mastoid antrum, and even the interior of the labyrinth, and the adjacent meninges of the brain, have been patiently and repeatedly searched for bacteria, and cultures obtained for study and verification. Also all secretions of the ear, and especially those which are purulent, have been subjected to the same process. Cerumen, for instance, has been searched for the presence of micro-organisms, and one set of experiments¹⁶ covers a series of cultures made from fifty impacted cases. Large numbers of bacilli and cocci of different species were found, and their subsequent injection into animals produced disorders of the liver, lungs, and abdominal glands. But, in this particular instance, no practical deduction seems possible.

Among the curiosities of bacteriology may be mentioned a species of mold, removed from the human meatus,¹⁷ the spores of which were used for the inoculation of rabbits. These died in consequence, presenting characteristic symptoms of nephritis. The mold was therefore named *eurotium malignum*.

As might be expected *furuncles* have received a special share of attention, and have been thoroughly studied with reference to the influence of bacteria. Cultures made from their contents exhibit constantly the staphylococcus albus, aureus, or citreus, either singly or combined. Experiments with these cultures¹⁹ show that the presence alone of these cocci upon the surface of the skin is not sufficient to cause a furuncle, but that by rubbing they must be made to enter into the skin. How this entrance is really effected is a subject of interesting controversy, some holding an abrasion of the skin to be necessary, or an entrance by means of the gland ducts,¹⁸ while it is claimed by others to

¹⁶ Rohrer, *Arch. f. Ohrenheilk.*, vol. xxix. p. 44.

¹⁷ Lindt, *Arch. f. experim. Path. u. Pharm.*, vol. xxv. 3 and 4.

¹⁸ Loewenberg, *Trans. Ninth Internat. Med. Congr.*, 1877.

¹⁹ Sutton, *Jour. of Anat. and Physiol.*, vol. xxi. p. 299.

be demonstrated by the microscope that the staphylococcus aureus penetrates the skin, not by way of surface wounds or sweat glands, but into the hair follicles,²⁰ working down between the hair and the root-sheath. In either case the same mode of treatment, whether abortive, curative, or preventive, is in vogue with all who accept this view of the origin and infectiousness of furuncles; and that consists in the destruction of the cocci by the use of topical applications. Although digressive, there may be mentioned of these, kalium sulfuratum,²¹ corrosive sublimate,²² carbolic oil,²³ sublimate alcohol,²⁴ aluminium aceticum,²⁵ boric acid in alcohol,²⁶ carbolic acid glycerine,²⁷ menthol in petrolol,^{28 29} menthol in alcohol,³⁰ and menthol in sweet oil.^{31 32}

Coming to the middle ear we find the rôles played by bacteria, according to recent views, to be exceedingly important; and the amount of minute and exact knowledge concerning them which is already acquired may well be a matter of surprise. Briefly stated it is held that bacteria may find entrance to the middle ear³³ either by way of the eustachian tube, the blood circulation, the lymphatics, the membrana tympani,³⁴ or the fissura petro-squamosa; and that their presence may induce either excessive secretion of mucus, plastic changes, or the formation of pus. It is held by some that in the tympanic cavity may always be found a small number of bacteria³⁵ which remain harmless and

²⁰ Schimmelbusch, *Archiv. für Ohrenheilk.*, xxvii. p. 252.

²¹ Schwartz.

²² Kirchner, *Monatss. f. Ohrenheilk.*, No. 1, 1887.

²³ Politzer.

²⁴ Weber-Liel.

²⁵ Grosch, *Berlin. klin. Wochenschr.*, No. 18.

²⁶ Loewenberg, *Berlin. klin. Wochenschrift*, No. 28.

²⁷ Bronner, "Year Book of Treatment," 1890, p. 279.

²⁸ Anton and Szenes, *Prager med. Wochenschr.*, 1889, No. 33.

²⁹ Szenes, *Internat. klinische Rundschau*, Vienna, June, 1890.

³⁰ Hill, Year book of Tr., 1890, p. 279.

³¹ Cholewa, *Therap. Monatshefte*, June, 1889.

³² Cholewa, *Monatsschr. f. Ohrenheilk.*, etc., 1892, No. 3.

³³ Moos, Sec. of Otol. Internat. Med. Congress, Berlin, 1890.

³⁴ Moos, *Deutsche med. Wochenschr.*, 1890, Nos. 11 and 12.

³⁵ Zaufal, *Prager med. Wochenschr.*, 1889, Nos. 6-12.

quickly perish under ordinary conditions, but which may be aroused to activity and a virulent development under circumstances which favor. It has been experimentally demonstrated that such is the condition of the interior of the eustachian tube,³⁶ but all authorities agree that the most probable source of infecting germs in the tympanum is through the tube from the naso-pharynx.

In otitis media suppurativa which, of all forms of middle ear inflammation is the most important in this relation, and which has been the most carefully investigated, there have been found in the secretions³⁷ the streptococcus pyogenes,³⁸ the pneumococcus of Fraenkel, the pneumobacillus of Friedlander, and the staphylococcus pyogenes.³⁹ The first named is found the most frequently and in the most severe cases, which may be complicated with mastoiditis, purulent meningitis,⁴⁰ cerebral abscess, phlebitis, thrombosis, or pyæmia. This, it will be remembered, is the same microbe that produces puerperal fever and erysipelas. In mastoid inflammation this streptococcus is almost exclusively found,⁴¹ while its presence has been demonstrated upon the cerebral meninges,⁴² in a case of caries of the temporal bone, and in the labyrinth,⁴³ in fatal cases from diphtheria and measles. It is also this coccus which is present in the destructive otorrhœa of scarlatina. A less severe and more rapid form of inflammation, both as to development and resolution, is thought to be induced by

³⁶ Maggiora and Gradenigo, *Centralbl. f. Bacteriologie u. Parasitenkunde*, vol. viii. p. 582, 1890.

³⁷ Metter, *Ann. des mal. de l'oreille et du larynx*, 1888, No. 10.

³⁸ Levy and Schrader, *Arch. f. experiment. Path. u. Pharmacol.*, vol. xxvi. p. 223.

³⁹ Chatellier, *Soc. Anatomique*, November 23, 1888.

⁴⁰ Zaufal, *Prager med. Wochenschr.*, 1888, Nos. 20-21.

⁴¹ Créboisier de Vomécourt. "Contribution à l'étude du rôle des micro-organismes dans les otites moyennes purulantes et leur complications mastoïdiennes," 1892, Paris.

⁴² Netter.

⁴³ Moos.

⁴⁴ Marie Baskin, *Centralbl. f. Bacteriol. u. Parasitenkunde*, 1889, Nos. 13 and 14.

the pneumococcus. In connection with these four micro-organisms the tubercle bacillus is found not infrequently^{45 46} while the most recent discovery has been the presence of the bacillus pyocyaneus.⁴⁷ The presence and true character of these various bacteria have been verified, time and again, by the inoculation of mice, guinea pigs, and rabbits with cultures.

One suppurative case which underwent examination presented an especially interesting sequel. Re-examination eight weeks later, the discharge having continued, showed that the diplococcus which was first present, had disappeared, but had been replaced by the staphylococcus pyogenes albus. This condition is called by the observer³⁵ a "secondary infection," and it is argued that, in the same way, a tertiary might occur, and this process be, perhaps, a cause of the long duration of many suppurative cases and explain their marked tendency to become chronic.

In the middle ear suppuration of influenza there has been discovered⁴⁸ in addition to the streptococcus, the diplococcus pneumoniae and the staphylococcus, a bacillus of peculiar form⁴⁹ which could not be made to grow upon the usual nutrient material and which is considered to be the influenza bacillus.⁵⁰

As to the practical importance of these new discoveries, which have been so laboriously made, they teach us certainly the necessity of the most absolute cleanliness and antisepsis in our manipulation of aural cases, and especially in the care of instruments, which are used from one patient to another. Beyond this, as a means of prognosis or as a guide to treatment, very different estimates are held of the value of our present knowledge of these bacteria. It is thought by some that the fact of the presence of a given

⁴⁵ Field, Harveian Lectures, *Brit. Med. Journal*, December 3, 1892.

⁴⁶ Cohnstädt, *Monatsschr. f. Ohrenheilk.*, etc., 1892, No. 5.

⁴⁷ Martha, *Arch. de medic. experim.*, January, 1892.

⁴⁸ Zaufal, *Prager med. Wochenschr.*, 1892, No. 8.

⁴⁹ Scheibe, *Centralbl. f. Bacteriologie u. Parasitenkunde*, vol. viii. p. 225, 1890.

⁵⁰ Scheibe, *Munch. med. Wochenschr.*, 1892, No. 14.

microbe, whether it be regarded as the primary cause of the diseased condition or not,⁴⁰ will determine the after progress of the disease in fixed channels;³⁷ while others believe that the finding of a certain coccus in the secretions can give no aid in the prognosis of aural disease, since the same microbe will at one time occasion only slight local effects and at other times serious general disturbances,³⁸ and since, indeed, inflammatory processes differing as much as the catarrhal and the suppurative are due to identically the same micro-organisms,⁵¹ it is more than probable that the present store of knowledge is only a step toward the ultimate benefit which may accrue to otology from the science of bacteriology, and it is hoped that this will eventually reward the zeal of the workers in this obscure field.

⁵¹ Maggiora and Gradenigo, *Centralblatt für Bacteriologie und Parasitenkunde*, etc. 1891, No. 19.

THE TREATMENT OF CHRONIC RHINITIS BY THE HOMEOPATH.

CHARLES E. TEETS, M. D., NEW YORK.

In this paper I will treat of two forms of chronic catarrh : those in which there exist permanent hypertrophies, and those which are characterized by intermittent swellings of the Schneiderian mucous membrane.

These two forms are the most frequent of all varieties of chronic rhinitis.

In the treatment of chronic catarrh, where there exist obstructions of any kind, the first step to be taken is to remove these obstructions ; then, with homeopathic remedies, we may expect favorable results. These results we would not obtain without this preliminary treatment.

I know that objections have been made by some homeopathic physicians to such a course ; they claiming that unfavorable results follow operative treatment.

These objections, however, come from those who have had very little experience, but who, on the other hand, are always heavily loaded with theories. The large practical experience which I have had warrants me in saying that these objections are unfounded. I shall prove, on the contrary, that only the most favorable results follow operative procedures, when performed in a proper and skillful manner.

It has been said that, where such line of treatment is followed, it does not differ from that used by old school specialists ; and, moreover, that it makes very little difference whether a patient is operated upon by an old school or a homeopathic specialist.

I shall have to take exception to this, because the two have different objects in view and their respective operative procedures are entirely different.

In the first place, the old school specialist uses operative measures as a last resort, and expects such measures will *complete* the cure. This it too often does not do. The homeopathic specialist, on the other hand, resorts to operative measures for the purpose of paving the way to future treatment, which must be in part homeopathic—to effect a permanent cure.

In the second place, old school specialists, as a general thing, remove as much tissue from the nose as possible—leaving the cavities spacious, and, often, too much so. The homeopathic specialist, on the other hand, removes as little tissue as possible, and yet quite enough to produce the desired result, which is to prepare the case for future treatment.

Having differentiated thus between the old school and the homeopathic specialists, I shall next endeavor to meet the objections made to operative treatment, by adducing facts instead of theories.

It is claimed that the removal of bone, cartilage, and mucous membrane from the nasal cavities is followed, in time, by their becoming abnormally large, and frequently results in atrophic catarrh.

To the first objection, I will say that it has been proved to be groundless. I have not one out of the large number of cases upon which I have operated that presented results claimed above, after the operation. In fact, in two cases to which I wish to call special attention, the operation produced effects just the opposite. Instead of shrinkage of the parts, there was an increase of tissue, and a consequent narrowing of the nasal cavity.

Miss M. came to me, complaining of an obstruction in the left nasal cavity. On examination, I discovered that the septum was slightly deflected to the left, while along the cartilaginous portion there was a horizontal ridge, which completely obstructed the left side. The latter was removed and the septum planed off,

leaving the cavity large enough to pass a wooden plug $\frac{1}{4}$ in. wide and $\frac{1}{2}$ in. high. This was kept in position for six days—removing it every other day for antiseptic cleansing of the parts. Three months afterward I found the nasal cavity in almost as bad condition as before the operation was performed. A second operation was resorted to. After this I kept the patient under observation, seeing her two or three times a week. At the end of six weeks, I could see that the cavity was gradually filling up, and that something must be done to arrest the overgrowth of tissue. I then had recourse to the galvanic cautery, using a flat electrode. This was effectual, not only in removing some of the redundant tissue, but also in arresting the further progress of the growth. I will not tax your patience with a description of the second case, as it was similar to the one just cited, and was treated in the same manner, with good results.

In reply to the second objection—that operations on the nasal cavities are frequently followed by atrophic catarrh, I would say that it is without any foundation whatever. In twenty-five cases, which I have had the opportunity of keeping under observation, and which I examined eighteen and thirty months after the operation, not one presented any evidence of dryness of the parts operated upon, or of atrophic catarrh. In fact, it would have been impossible for anyone but the operator to have discovered what portion of the septum had been operated upon, as the mucous membrane had been reproduced, to all appearance, in its original and normal condition. I believe that all who have had any wide experience in operations upon the nasal cavities will agree that only good can result from a properly performed operation.

The failure to obtain good results from operations of this character is due, in most instances, to neglected after treatment. Hence its supreme importance. It must be frequent and long continued.

I am decidedly in favor of conservative surgical procedures in cases of chronic catarrh; but there are only three classes of cases in which I would consider it necessary to use operative measures. First: those in which

obstructions prevent proper drainage of the nasal cavities. Second: those in which the passages are so narrow that the least irritation, whether the result of atmospheric changes, particles of dust, or irritating vapors, causes swelling of the parts, and produces contact of the external and internal walls. If left alone, this would result in adhesion of the parts. Third: those in which adhesion of the external and internal walls has already taken place, and to which Browne has given the name of synostosis.

It is not necessary that every spur and ridge upon the septum should be moved; nor is it necessary that the septum should be perfectly smooth. It is not good surgery to hold that every departure from the right line in the position of the septum demands treatment. And here is where a great many inexperienced operators make their mistake. It is the neglect of not paying particular attention to what is proper and necessary to be removed that justly brings specialism into disrepute. It is desirable, also, to operate by artificial light reflected from the forehead mirror; but, in that case, the operator must be familiar with the use of the head mirror, and be able instantly and automatically to follow any motion of the patient's head with the directed illumination, during the few minutes consumed by the operation. Antiseptic cleansing of the parts, before operating and during healing, is desirable. The nasal cavities having been cleansed, the parts should be thoroughly anæsthetized, so that all pain may be avoided. This is best accomplished by saturating a strip of lintine, about half an inch wide, with a ten to twenty per cent. solution of cocaine. This is passed into the side to be operated upon by means of a flat applicator, and made to cover the tissue to be removed. Satisfied that all sensibility has been destroyed, we should perform the operation with as little inconvenience to the patient as possible, selecting those instruments which will give the least disturbance to the patient consistent with the best attainable results. The nasal saw, snare, trephine, drill, chisel, and

gouge, together with various other accessories, has each its proper place in the domain of nasal surgery.

Having finished the operation, the next important part is the after treatment. The results will depend largely upon the attention paid to it.

The conditions present in the nasal cavities will not allow of an antiseptic dressing that may be left there for three or four days, as may be done in other parts of the body; but the healing process must go on in the presence of septic surroundings. In consequence of this the patient should be seen and treated every other day, for two weeks: afterward, twice a week, until the healing process is completed. During the first week after the operation I would advise insufflation of powdered euprophen. In the second week, and until the parts are completely healed, liquid petroleum, to which have been added calendula and eucalyptol. By means of an atomizer they are easily brought into contact with the membrane of the nasal cavities; and are not only soothing to the mucous surface, but also protect the membrane from atmospheric influences. During the first week arnica may be employed with good results, unless some other remedy is plainly indicated.

There are so many medicines that can be used locally in chronic catarrh that it would consume too much time even to enumerate them.

A few only, and the most important, may be mentioned: menthol, eucalyptol, calendula, tar, thuja, carbolic acid, aceto-tartrate of aluminium. By various means liquid petroleum will take into solution the drugs mentioned, and act as a better medium than water; with the exception of the aluminium-aceto-tartrate, which should be used in an aqueous solution.

Some specialists have been quoted as using menthol with petroleum, in the proportion of sixty grains to the ounce; and oil of eucalyptus one dram to the ounce. This proportion I consider far too strong, as it is not only painful but irritating to the membrane. Menthol should

not be used in a proportion to exceed ten grains to the ounce ; and, sometimes, five grains will suffice.

Menthol is indicated in painful inflammatory affections, and where there is frequent erection of the mucous membrane, especially of that covering the turbinated bodies.

Eucalyptol (Sanders) should not be used stronger than half a dram to the ounce ; and, in some cases, thirty drops are sufficient. It is indicated in inflammatory swellings of the mucous membrane, accompanied by excessive secretions.

Thuja, combined with petroleum, has not been mentioned by old school specialists, yet it is one of the best local remedies we have. It is useful after operations, to assist the healing process ; and is also indicated where there is a discharge of offensive purulent mucus, and ulceration and scabs in the nostril. It has also given satisfactory results, when not too strong, in dry coryza.

The aceto-tartrate of aluminium may be used either in solution, in the proportion of one dram to the ounce, or in combination with boric acid, equal parts. It has styptic and antiseptic qualities ; and is, therefore, used chiefly to arrest hemorrhage after operations, and for its antiseptic qualities. It is, however, also useful in hypertrophic rhinitis ; a rapid subsidence of the swelling being brought about by insufflations of this drug with boric acid, equal parts or one to two.

Hypertrophy of the mucous membrane, covering the turbinated bodies, may be reduced, either by the galvano-cautery or some strong acid. I know of no acid that answers the purpose so well as the trichloracetic. It has an advantage over all other acids of which I have any knowledge. The pain produced by the cauterization is insignificant ; the eschar which is formed is uniformly thick, is almost inodorous, produces no unsatisfactory action, and leaves no unpleasant after effects. Immediately after the application of the acid a bright ivory-white scab is formed, which remains localized to the point of application. This latter quality is a great advantage, as it does not spread to

other parts as do many diliquescent caustics—for instance, chromic acid.

Special attention should be paid to keeping spray tubes and instruments clean ; for back of the unclean instrument is an unclean and careless operator.

Having journeyed thus far with the old school specialist, operating possibly in the same manner, and with the same kind of instruments, yet with different objects in view—come we to the place where we must part company.

The old school specialist, having finished the operation and the healing process being completed, if the case is not entirely cured, has nothing else to resort to but local remedies. These too often fail to complete the cure.

On the other hand, the homeopathic specialist, having prepared his case for future homeopathic treatment, looks forward with confidence, knowing that he has a host of remedies, which, if carefully selected and applied, according to the principle *similia similibus curantur*, will effect a permanent cure.

There is no branch of medicine in which greater laurels could be won for homeopathy, if we were not too conservative, than in this branch of rhinology.

After the obstructions have been removed, the remedies that will be found to give the best results are as follows:

Belladonna: Throbbing headache, worse from motion and leaning forward ; tip of the nose red ; with burning in the nose ; discharge of mucus mixed with blood ; especially useful in the first and second week after operation.

Kali bichromicum: Frontal headache ; formation of hard plugs in the nostrils ; dryness of the nose, with a feeling of pressure at the root of the nose ; tenacious ropy discharge from the posterior nares, adhering to the pharynx and removed with difficulty.

Kali iodatum: Acts similarly to *kali bichromicum*, except that the *kali-iodatum* patient has more hypertrophy of the mucous membrane of the nose ; the throat is dry ; the glands enlarged, or presenting some evidence of scrofulous or syphilitic taint.

Lobelia cerulea : Great depression of spirits ; pain in the left side of the head, and over the root of the nose ; first, itching and tingling feeling in the left nostril, followed by frequent sneezing, with copious discharge of thick mucus from both nostrils ; nostrils very sensitive, so that inhalation of air creates a slightly painful feeling ; this remedy is especially adapted to such cases as are subject to catarrhal inflammation of the posterior nares and fauces, and in which there appear upon the posterior and lateral walls of the pharynx red elevated spots.

Passiflora incarnata : Distressing pain at the root of the nose ; complete stoppage of one or both nostrils ; discharge slight and thick ; restless sleep.

Paris quadrifolia : Pain in the right temporal region, extending to the frontal sinus and root of the nose ; discharge of red or greenish mucus, on blowing the nose ; stuffed condition and fullness at the root of the nose ; constant hawking of tenacious mucus : fauces dry in the morning.

Hyoscyamus : Buzzing and singing in the ears ; sense of smell weak ; jerking pain at the root of the nose ; mucous membrane of the nose dry ; this remedy is given by the old school, when the secretions are excessive and there is much restlessness—a few drops of the tincture being given ; when the secretions are suppressed, especially after operations, it will give good results, when given in the third or sixth potency.

Spigelia : Pain in the temples and forehead, extending toward the eyes ; discharge thin, copious, flows mostly through the posterior nares, causing choking at night, and when lying down. I have verified the latter symptoms in my practice repeatedly.

Senecio aureus : Inability to fix the mind on any one subject ; dull, stupefying headache ; secretions slight or suppressed ; sneezing, burning, and fullness in the nostrils—the burning being especially confined to the nasopharynx ; dryness of the mouth and pharynx ; some pain in swallowing.

Thuja : Pain at the root of the nose ; ulceration and

scabs in the nose ; discharge of thick, sometimes offensive green mucus, mixed with blood ; red, itching eruption on the alæ of the nose, which is frequently moist.

Wyethia : Pain over the right eye ; pricking, dry sensation in posterior nares ; sensation as if some foreign substance were in the nasal passages—an effort to clear them through the throat affords no relief ; dryness of the fauces, with constant desire to clear the throat by hemming.

Besides these remedies, the following deserve due consideration :

Arsenicum ; ars. iod. ; calc. phos. ; calc. carb. ; calc. iod. ; hepar ; hydrast. can. ; hydrast. mur. ; puls. ; sepia ; bals. peru.

As a general rule, the above remedies will be found sufficient. However, in particular cases, other remedies may have to be chosen.

In addition to the treatment given above, the nasal cavities should be cleansed once a day, with some non-irritating solution, either with a douche, atomizer, or very small syringe.

I always advise the use of a small glass syringe, directing the patient, as the piston or rod is pushed in, to gently snuff up the solution—propelling it along the nose to the naso-pharynx, cleansing this cavity, and allowing it to pass out through the mouth.

THE STUDY AND CORRECTION OF HETERO-PHORIA.

BY HAROLD WILSON, M. D., DETROIT, MICH.

Heterophoria may be defined as that condition in which binocular vision being temporarily suspended, the visual lines of the two eyes do not intersect at the point of fixation. It is characterized by a change in the normal innervation of the ocular muscles when the binocular fusion of images is prevented. Under normal conditions, binocular vision for a given point is maintained by the co-ordinate action of the entire group of these muscles, and in the ideal eye, at least within certain limits, the innervation of these muscles is not a necessary function of the binocular act. That is to say, the binocular fusion of images being suspended, the innervation remains unaltered. It becomes a function of this act, only in states of heterophoria.

Heterophoria is due essentially to a condition of faulty innervation, which depends upon one or more of the following factors :

1. The form and position of the eyeballs (orbits).
2. The place of insertion of the ocular muscles.
3. The essential and relative power of the ocular muscles (amplitude of convergence).
4. The ratio of the positive and negative portions of the relative accommodation, together with the ratio of the convergence and accommodation for the point in question.

Under the first head it is clear that, assuming certain ratios of tension among the muscles of the eye as normal when fixing some point at a given distance from the eye,

such as 1 m., for example, these ratios must vary with the length of the basal line of the eyes. For at this distance, with a basal line of 50 mm. the angle of convergence is 1.43° , while with a basal line of 75 mm., it is 2.15° . In high degrees of myopia the alterations in the form of the eyeballs limit their mobility, and consequently modify the convergence tension of the muscles.

There is some variation in the place of insertion of the ocular muscles. Stilling has observed a wide variation in that of the superior oblique. We may assume as normal the following measurements, representing the distances of the insertion of the recti muscles from the cornea (Fuchs).

Rectus internus, 5.5 mm.; rectus externus, 6.9 mm.; rectus inferior, 6.5 mm.; rectus superior, 7.7 mm.

In an eye where the muscular balance is ordinarily good, one or more muscles may become weakened by fatigue or disease, necessitating an increase in the amount of nervous stimulus to these muscles in order to preserve binocular vision. Under these circumstances, if binocular vision becomes abrogated, heterophoria is an easy and necessary consequence. Here we have true "muscular insufficiency."

From the essential connection of accommodation and convergence it is evident that the ratio of the positive and negative portions of the relative accommodation for any given point has an important bearing upon the muscular balance for that point. Indeed, if no other factor were operative to affect the muscular equilibrium, it seems reasonable to assume that it could be calculated from the knowledge of the relative accommodation. However, as a matter of fact, other causes uniformly do exert an influence upon the position of the eyes, and moreover may be of such moment that their effects entirely negative that of the relative accommodation.

We see, then, that heterophoria may originate in a number of ways. From the variety of causes, we may infer that there must be a corresponding variation in the treatment of this disorder. We shall revert to this further on.

Methods of examination.—In ascertaining the amount and

character of the heterophoria present in a given case, the essential determination to be made is the position of the non-fixing or deviating eye. The common and most exact methods of making this determination are subjective. Of objective methods, the only one that is practical is the old test of alternately covering and uncovering one eye with a screen. This is too crude to be of much value. Subjective methods depend upon the uniformity and congruity of retinal projection. The first instrument of precision for making the necessary measurements was Stevens' phorometer. With this instrument, supposing the patient to be of ordinary intelligence, it is possible to measure deviations of the eyes in any plane with much accuracy. The substitution of a "stopped" convex lens of short focus for the vertical and horizontal prisms employed in the phorometer added to the rapidity with which a diagnosis as to the character of the deviation could be made. The "rod test" of Maddox marked another gain in the rapidity of the examination, and made it possible to measure the deviation of the non-fixing eye by means of scales drawn upon the wall of the examining room. Burnett's use of a strong convex cylinder was based upon the same principle. Another gain in convenience and precision was the introduction of the rotating prisms of Stevens, by which the separate displacing prisms were done away with. I have added another instrument to this number, a rough model of which I have the pleasure of exhibiting to this Section. It consists essentially of a frame holding upon its right side a cell containing two 6° prisms with their bases in contact; or a Maddox rod, suitably mounted; and on the left, a "prism mobile" of two 5° prisms, which by suitable mechanism may be rotated in the same or in opposite directions, and the amount of rotation measured upon a graduated circle so placed as to be easily seen by the observer. Behind the openings of this frame or slide are clips for holding various accessories, such as abducting or adducting prisms, a red glass, etc. With the double prisms in proper position, and the "prism mobile" at 0, set to give horizontal displacements, the patient looks

at the point of light thrown through both openings, and sees three images of it. The middle image is seen by the left eye, and by turning the milled head of the "prism mobile," it may be displaced horizontally either to the right or left, from 0 to 10° . If, therefore, this image is not in a straight line with the other two, it may be quickly brought into this position, and the exophoria or esophoria read off at once upon the graduated circle at the patient's left. To measure deviations in any other plane, the double prism is rotated into that plane; the "prism mobile" brought to zero; the small milled head in the face of the instrument pushed well up, and the pinion of the recording disk being pulled out, the two prisms are rotated by means of this milled head in the same direction, to the desired angle, when, these adjustments being reversed, the measurements are made in the same manner as at first. A little familiarity with the instrument will enable the observer to make these adjustments very rapidly. The Maddox rod may be substituted for the double prism, if desired. To measure heterophoria greater than 10° , a supplementary prism may be inserted in the proper position in one of the rear clips, and its value added to the readings of the instrument.

To measure abduction and adduction, or in fact muscular power in any direction, the double prism or the rod is removed from the right-hand cell, and the "prism mobile" having been set in the desired position, the muscular power can be easily found by rotation of the milled head at the left. In these determinations also, supplementary prisms can be inserted into the clips, if necessary.

It will be seen that a considerable variety of measurements may be made by this instrument with rapidity and accuracy. Almost any object of fixation may be used, and at any distance from the eye. The value of the double prism is that it is easier to determine whether three points are in the same straight line "than whether (as in Stevens' phorometer) two points are in an exactly horizontal or vertical line, as the case may be. I believe that the credit of suggesting this use of the double prism is due to Savage,

although the first model of this instrument was made long before his suggestion came under my observation."

So far as accuracy is concerned, there is a substantial agreement in the results obtained by the use of Stevens' phorometer, the rod test, and the little instrument above described. Bissell has made a series of comparisons of the rod and prism tests. In fifty-two cases of heterophoria, the findings of the rod test were greater than those of the prism test in twenty-six, the differences ranging from 0.25 to 4 prism dioptries, from which he concludes that the rod test is the more accurate. I do not believe that this accords with the experience of observers generally.

For the determination of "insufficiencies of the oblique muscles," Savage employs the double prism before one eye, and a horizontal stripe at a distance of eleven inches, as a test object. If there is an insufficiency present, the middle line will run obliquely between the other two, the direction of the obliquity being dependent upon the particular muscle at fault.

Heterophoria may be measured in degrees of refracting angle, or of minimum deviation; in prism dioptries; in meter-angles, or in centirads. The most common method is to use the refracting angle of the necessary prism. There is at present no agreement among oculists as to the most desirable of the various reforms that have been suggested.

Symptoms.—In attempting to enumerate the symptoms of heterophoria we enter at once upon debatable ground. A wide difference of opinion prevails among physicians as to the symptoms which heterophoria is capable of setting up. On the one hand is a class of enthusiasts who claim for this disorder the power of exciting numerous remote and profound alterations in the functions of the nervous system, extending its effects to include chorea, epilepsy, and insanity. In support of this claim, clinical experience in these affections is set forth, showing that they have sometimes been relieved by proper treatment directed to the heterophoria. On the other hand there are those who deny these claims *in toto*, and presumably upon scientific

grounds. It is difficult to deny the evidence of one's own experience, or that of other competent observers, but it is not always easy to interpret clinical facts. So far as concerns the cure of remote disturbances of the nervous system, such as epilepsy, for example, by the performance of graduated tenotomy, it must be borne in mind that, in idiopathic epilepsy at least, patients have often recovered as an apparent result of a variety of surgical operations, such as trepanation without discoverable lesion of the brain or meninges; circumcision for phimosis; the excision of scar tissue; the removal of bullets, and many other diverse procedures. It is of the greatest importance to observe the fact that there is often a curative influence from a purely indifferent surgical operation. Thus we have recorded cases where, independent of the direct and proper results of the operation, abdominal tumors of considerable size have disappeared after a simple incision of the abdominal walls, and hip disease has been cured, it is said, by removal of the foreskin. Even without the hypothetical effects of trauma upon the nutrition, functional and organic diseases have not infrequently, I think, been cured simply by some radical change in the patient's emotional state. My attention has just been called to a case of cataract reported as cured by "Christian Science." From the accumulated evidence now in hand, I believe that hardly more can be affirmed than that these remote neuroses may in rare instances be among the symptoms of heterophoria, but that their claim to such a place has not yet been established beyond cavil.

Seguin has recently given a provisional statement of the symptoms of certain forms of eye strain. According to this writer, paresis (insufficiency) of the third cerebral nerves and attached muscles (in which condition we may get exophoria or hyperphoria, or both) is marked by certain rather definite symptoms, of which he regards occipito-cervical pain and distress as the most characteristic. "The pain," he says, "diurnal as a rule, and often not appearing until the patient has used his eyes in dressing, eating, or

reading, is usually greatest between the occipital bone and the second vertebra, though it often extends from the upper part of the occiput to the fourth or even sixth vertebra. It is sometimes more a 'distress' than a true pain, and is often accompanied by sensations of stiffness and tightness (as if a hand grasped the neck). There is never, strictly speaking, neuralgia of the occipital nerves, or objective rigidity as in beginning caries. Tenderness is rarely found, though in women, spinal hyperæsthesia (so-called spinal irritation) often coincides. Frequently there is a sensation of weight or downward pressure on the back part of the head, with (usually) intermittent numbness (a 'dead' or 'wooden' feeling) and formication. In some cases the fullness or tightness (cincture or cap-feeling) extends to the whole head. Apparent loss of power of attention and concentration (volition) is much complained of, even to a degree simulating mental failure. Reading, writing, sewing, piano practice, conversation, even eating are painful or unbearable; in other words, the symptoms are increased by any act requiring convergence and accommodation. The prolonged duration of these symptoms, or rather of the strain, may lead to neurasthenia, insomnia, and a curious mixture of hysteria and hypochondria, so that the diagnosis becomes more obscure. Headache is not rare, but in such cases there are also faults of refraction or other factors. Simple asthenopia, sense of fatigue, or pain in the eyes, orbits, brow or temples, is only occasional, and seldom a prominent symptom. Usually the patient pretends to have strong eyes." Payne has recorded a somewhat similar classification, referring the occipital headaches to exophoria and hyperphoria. He adds the additional symptom that these patients show marked inability to use their eyes at night, while their ordinary use in the daytime is comparatively easy. Frontal pain or headache is referred to excessive strain or convergence or accommodation, as in hyperopia and astigmatism.

The symptoms of esophoria are less clearly marked. Seguin notes as associated with paresis of the sixth cere-

bral nerve that a sense of confusion, or dizziness, not a true vertigo, is one of the most prominent symptoms. The use of the eyes for distant objects, walking in the streets, contact and business with other persons; attendance at church, or in the theater; sight-seeing; shopping, and similar occupations may be productive of great distress to the patient, who feels better when quiet and alone. "Various and peculiar sensations are felt in the head—such as a sense of fullness, 'as if the head would burst'; a downward pressure on the head, diffused or localized, 'as if a stone or sharp stick' pressed on it; a sense of constriction, general or cincture-like; pain in various areas of the scalp; occasional feelings of numbness (a 'dead' or 'wooden' feeling), or of formication or wormlike crawling, also variously distributed; a quasi tinnitus, or noise in the head (not in the ears) is not rare." (Seguin).

The symptoms of esophoria are not so characteristic as those of exophoria and hyperphoria, and will be seen to overlap them.

Insomnia and general nervous debility are said to be not uncommon results of continued eye strain. In the eyeball itself there are reasons to believe that various forms of local inflammatory affections, such as conjunctival hyperæmia, blepharitis, ulcers, etc. (Stevens), may sometimes be directly dependent upon eye strain. Stevens has called attention to certain facial expressions characteristic of the various forms of heterophoria. In esophoria, for example, the brows are compressed, with the inner end curving down toward the nose; lines upon the forehead low. In exophoria, the brows are raised or arched; lines upon the forehead high. In hyperphoria, the features are more irregular, and one eyebrow is compressed or drawn down to correspond with the hyperphoria.

Treatment.—Here, again, we enter upon a subject where widely different opinions are held. In approaching the question of treatment, we must not fail to bear in mind the various causes which may lie back of the heterophoria. I am convinced that an intelligent appreciation of the

causation in a given case, where possible, will often lead to a more just treatment than could be given by any manner of routine. It is true that it is often impossible to ascertain the cause in a given case of heterophoria with any exactness, but even a reasonable inference is highly desirable. Thus, in a case of exophoria due to paresis of the infernal recti from general debility or overwork, it would be manifestly improper to resort to tenotomy for its correction, while, if it were due to the anatomical changes in the eyeball incident to a high-grade myopia, the surgical procedure might be eminently proper.

The treatment of heterophoria should begin with the determination of the following points:

1. The amount and character of the heterophoria; (*a*) for infinity, (*b*) for reading distance, *i. e.*, $\frac{1}{3}$ meter.
2. The mobility of the eyeballs in various directions.
3. The refraction.
4. The muscular power, (*a*) adduction, (*b*) abduction, (*c*) sursumduction, (*d*) amplitude of convergence.
5. The relative accommodation, (*a*) for infinity, (*b*) for reading distance.

The practical value of these determinations is evident. That of the relative accommodation will be necessary or at least useful, in certain cases only. The amplitude of convergence may be determined by means of Landolt's ophthalmodynamometer, for its positive, and abducting prisms for its negative, portion. The information which it supplies is largely contained in the determination of the adduction and abduction. Thus, if the negative convergence—abduction in a given case—is markedly defective, tenotomy of the internal recti muscles for exophoria would be inadmissible.

Hyperphoria.—Stevens states that the treatment for hyperphoria is tenotomy. This statement is in accord with my own experience. In some cases, where there is an error of refraction requiring the constant use of glasses, a correcting prism may be incorporated with them, and give satisfactory relief; or with emmetropic eyes, the prism

may be mounted in spectacle frames and worn constantly. It is questionable what internal remedies can do for the relief of hyperphoria. The late George S. Norton in 1889 called attention to the provings of senega and onosmodium, and their usefulness in affections of the ocular muscles, and reported a number of cases in which these drugs had been used with apparent benefit. The value of senega in hyperphoria has been made the subject of a recent communication by Linnell,* but, as I have elsewhere endeavored to show,† the usefulness of the remedy in this disorder is by no means proven by the cases related. Indeed, the provings of senega do not show any special adaptability of the drug to hyperphoria, so far as we understand the symptoms of this affection. Nevertheless, it might have an empirical or clinical value, but the evidence even here is defective. Norton says that the symptoms calling for senega are "dull, tired, aching, pressing pains in the eyes, or throughout the whole head, with smarting and burning in the eyes, always worse after using them, and often accompanied by catarrhal symptoms of the conjunctiva."

Onosmodium has many symptoms of heterophoria, *e. g.*, occipital headache; a dull aching pain extending down the back of the neck, or over one side of the head, generally the left; vertigo, with strained or stiff sensation in the eyes, aggravated by use of the eyes for near work. Gelsemium has a transient vertical diplopia, and may be of value in those cases of hyperphoria accompanied with the paretic or other characteristic symptoms of the remedy. Stramonium shows a marked vertical diplopia in its provings. The importance of this symptom, in the proving of a drug, is simply that it indicates that the drug has a direct influence upon those muscles which are concerned in the production of hyperphoria. We do not find diplopia, "unless it be transitory," in heterophoria. But, as a drug symptom, diplopia is an indication that the remedy has an action along the line in

* JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY, AND LARYNGOLOGY, January, 1893.

† *Ibid.*, April, 1893.

which we seek for curative effects, and suggests that it may possess valuable therapeutic properties in the treatment of affections of the upward and downward turning muscles of the eyes. So far as the applicability of these or other drugs to the cure of hyperphoria is concerned, the evidence in their favor is at the best obscured by the fact that, in almost all of the cases reported, other treatment than the medicinal was given the patient, so that the action of the remedy is not clearly shown. Norton himself limits all attempts at a cure to hyperphoria of less than 2° . In higher degrees an immediate tenotomy was advised.

Systematic exercise of the affected muscles by means of prisms has been used and recommended as a cure for hyperphoria, and the clinical evidence in our hands is favorable to its usefulness. In hyperphoria of 1° and perhaps 2° , if persisted in, it may effect a cure, but in higher degrees it does not seem to be of much value.

In a case where there is a manifest hyperphoria of say, 1° , circumstances often suggest that there is an additional amount that is latent, and a correcting prism is prescribed, to be worn constantly, for the purpose of revealing this latent defect. Under these circumstances, in many instances, the daily examination will show an apparent increase in the hyperphoria, until we may have developed in the course of a week, beginning with 1° , as much as 5° or more. This final amount is then accepted as the total of the real hyperphoria present, and made the basis of an operative correction. Now while it may happen the latent hyperphoria can be made manifest in this way in some instances, we must not lose sight of the fact that, under the constant influence of a prism, the normal equilibrium of the eyes will often temporarily be changed so as to generate a species of false heterophoria. Thus it is possible to produce at will exophoria or esophoria in the same eyes, by wearing a prism with the base in or out, as the case may be, and either right or left hyperphoria, as we please, in a similar manner. The heterophoria thus produced is of variable duration, but always temporary. It may not be possible

always to distinguish between the fictitious and the real defect. The increased relief of concomitant symptoms, by the corrected increase in the manifest heterophoria, if it occurs, or the greater permanency of the disordered equilibrium, might serve as distinguishing marks; but if we accept as the true state of muscular equilibrium that shown while the eyes are under the influence of prisms constantly worn, we are treading upon dangerous ground, and if it is taken as the guide to the extent of the operation, we are apt to inflict our patients with an over-correction.

With regard to the details of the operation itself I have little to say, except that in tenotomy of the rectus superior, care must be taken to make the incision high enough, so that the tendon of the muscle will lie in the wound. Rather than fail in this respect, the operator should measure the necessary eight mm. from the corneal margin with exactness. In my experience, complete section of the tendon is required for the correction of even low degrees of hyperphoria. The lid retractor, held by an assistant, is much more comfortable for the patient than the spring speculum. At the end of the operation the correction should be as nearly perfect as possible. If an over-correction is made, an appropriate advancement is easily done.

Exophoria and Esophoria.—As in the treatment of hyperphoria, we have here a variety of methods to choose from: surgical, gymnastic, hygienic, and medicinal. As indicated above, we are to be guided by the causes lying back of the particular trouble in question, so far as we are able to discover them. There is associated with most cases of disturbed muscular equilibrium a defective ratio of adduction and abduction, as well as positive deficiencies in muscular power. Thus, in a typical case of exophoria, we may find that the adduction is abnormally low, or the abduction excessively high. In the exceptional and irregular cases this does not obtain. We may have exophoria with an adduction of 40° or 50° . Or there may be exophoria in remote vision and esophoria for the near point; or the reverse may

be true. Out of 229 cases of exophoria, Norton found 10 with esophoria in accommodation; in 158 cases of esophoria there were 68 with exophoria in accommodation. These atypical cases are credited to the disturbing influence of hyperphoria, and the recommendation is made to correct this before undertaking the correction of the lateral disturbances. In some cases clinical experience seems to justify this assumption. Upon theoretical grounds, however, there would not seem to be any satisfactory explanation of what we may call "crossed heterophoria," in a faulty innervation of the superior or inferior recti muscles. It is true that there is a slightly increased tension of these muscles in the act of convergence, but this seems hardly enough to account for the abnormal conditions so frequently met with. As I have elsewhere suggested, a more rational and satisfactory explanation of "crossed heterophoria" may be found in the relations between accommodation and convergence. If we have a case of slight esophoria in remote vision, for example, it is easy to conceive that convergence for the near point, exophoria might result from an enfeebled power of accommodation, by which the added stimulus of the accommodative act was not adequate to maintain the necessary convergence. This is easily shown in an experimental way by observing the effect of convex and concave glasses upon the position of equilibrium of the eyes in fixation for the near point. If we have orthophoria, or a low degree of esophoria for distance, we can obtain exophoria at the near point by decreasing the amount of accommodation in use for that point by means of convex glasses. Exophoria may be transformed into esophoria or into orthophoria in a like manner, by means of concave glasses. These experiments show very clearly the ease with which "crossed heterophoria" may be explained independently of a real or hypothetical hyperphoria. They also suggest a possible method of treatment in some cases, by such exercise of the accommodation as will increase its positive range. Clinical experience to justify this suggestion is wanting, as cases entirely appropriate to it have not come under my

observation since the idea occurred to me. I am satisfied, however, that the key to the explanation and treatment of a good many puzzling cases of heterophoria will be found in a study of the relations between the accommodation and convergence, and in the relative amplitude of accommodation.

Tenotomy of the stronger muscle after the method of Stevens is a familiar method of treatment. The extent of the operation is determined by the amplitude of convergence. If we have exophoria with subnormal abduction for the far point, it will be improper to tenotomize the already weak muscles. In fact it may be laid down, as a general rule, that a tenotomy is indicated in exophoria, only when there is an absolute or relatively excessive abduction. In the contradictory cases the treatment must first be directed to increasing the power of the weak muscles, and of the accommodation, if necessary. If there is hyperphoria present, it may be relieved. The immediate effects of a tenotomy upon the lateral muscles may exceed the final effect desired by 1° or 2° . It is highly important that the operation be made with the least possible disturbance of the tissues surrounding the muscle, so that there may be as little restriction of motion following it as is consistent with the correction of the heterophoria. The patient will commonly complain of diplopia in looking to the extreme limit of the field in the direction of the tenotomized muscle, and it may be many months, or even a year or two, before this will disappear. If the operation has not been too extensive, normal mobility will be eventually recovered.

In many cases of lateral heterophoria a tenotomy is unnecessary. The muscular balance, when but slightly deranged, will often be restored by the gymnastic use of prisms. This method of treatment will require numerous and frequent sittings. I prefer to add to the office treatments the gymnastic use of prisms by the patient several minutes daily, increasing the strength of the prisms as the adduction or abduction becomes greater. This exercise of prisms is to be recommended in all cases where the con-

vergence is abnormal, even though an operation be in view, and should be continued until as nearly a normal balance of power as possible is secured.

Therapeutics.—The sphere of action of remedies in the treatment of heterophoria is not well defined. The reason for this lies in the fact, already alluded to, that specialists are usually unwilling to restrict themselves to internal medication, but must also correct by mechanical or surgical, or by other accessory means, obvious defects in the eyes. Thus errors of refraction and accommodation must be corrected, and the use of systematic exercise and electricity are at least very common accompaniments. This compounding of remedial measures, together with the somewhat uncertain knowledge in our possession as to the natural history of eye strain, combine to increase that skepticism as to the value of drugs which the specialist seems naturally to possess. Speaking simply from my own experience, candor compels me to say that evidences of beneficial effects of medicine in heterophoria are very obscure. Still there are many men in our school who think otherwise, and this failure on my part may be a personal fault. Even among those who are the most sanguine in the use of remedies, however, it is fair to say that their employment is made to play a secondary part to the other methods we have considered. They are held to be useful adjuvants rather than the principal factors in the cure, and are often resorted to when other means have failed. It is far from my intention to disparage the use of internal remedies in the treatment of ocular disorders; and certainly, when we are called upon to avail ourselves of their help, our law of therapeutics gives us the most satisfactory guide; yet it cannot be denied that surgical, mechanical, and empirical local and constitutional methods are the stock in trade of the great majority of even those oculists who call themselves “homeopaths.” If it were less so perhaps it would be better, but we are called upon to face the facts as they are, not as we think they ought to be. If we have any better success in the practice of any branch of medicine

than our old school colleagues, it is due, directly or indirectly, to our law of therapeutics. We cannot afford, then, to indulge in too much skepticism as to the value of drugs.

Of the remedies likely to be of benefit in heterophoria, the following may be mentioned, as among the most important: onosmodium, gels., senega, stram., bry., phos., natr. mur., ruta, calc. phos., argent. nit.

LA GRIPPE A CAUSE OF MIDDLE EAR DISEASE.

BY HENRY C. HOUGHTON, M. D., NEW YORK CITY.

The unique form of disease generally known by the above French appellation has proved a very effective cause of middle ear disease. This disease manifests itself under three general types: nervous, gastric, and pulmonary. While it is true that one cannot draw dividing lines that are absolute, yet the above statement is generally true, as the preponderance of symptoms is in one or the other of these three directions.

The onset of the disease is marked by a sudden, sharp fever. The temperature rises to 103° – 105° , the patient suffering from a burning, febrile condition with rapid pulse, full arteries, tumultuous action of the heart, which may be soon, even if not at the time, followed by extreme prostration; indeed, this is the characteristic symptom of the disorder. In many cases this condition is made all the more uncomfortable by an intense coryza, involving the entire mucous surfaces of the head, throat, larynx, and large bronchi. The mucous membrane secretes an enormous amount of thin, watery, acrid secretion which denudes the air passages, altering the susceptibility, destroying the smell, taste, and touch of those portions which are exposed to ordinary gross inspection. The rapidity and force with which this disease attacks the eustachian tubes and mucous membrane of the middle ear is exceptional, and, in many cases, disastrous. The suddenness with which the catarrhal symptoms are followed by suppuration and rupture of the

drum-head would lead one to think that there had been a former history of middle ear disease, but in a number of cases the history shows nothing of the sort.

The usual symptoms of the middle ear under acute disease have been associated with those of the periosteum and muscular attachments to the temporal bone, and result in neuralgia, muscular soreness, and rigidity. One peculiar experience which I have noticed is the involution of the flaccid membrane, so that large *culs-de-sac* have formed in the region of the roof of the canal and burrowed downward over the upper half of the membrane, threatened to perforate, and in one or two instances such perforations have occurred. The relief which has followed spontaneous rupture, or artificial perforation, has been prompt, and the tendency to resolution immediate, followed by excellent results, so that the damage to the hearing apparatus has not been as great as in suppurative disease previously observed. I cannot think that this is due to any peculiar merits of treatment, either internal or local, but rather characteristic of this form of disease.

Of 531 cases of aural disease treated since the beginning of our experience with that specific form of influenza, called "grippe," 65 cases had very decided symptoms of it. In some it acted as the direct and immediate cause of the middle ear lesion; in others, quite a chronic condition; the grippe caused more or less disturbance and temporary loss of function, and, in some cases, loss of tissue, with tedious resolution.

The following cases may be of interest, as they illustrate the special features of the individual experience as well as the results of treatment.

The first case was seen December 13, 1889. A clear, definite attack of the influenza just two weeks previous had caused severe pain in the right ear, which suppurated but did not show any disposition to resolution. The right canal, at the time of examination, was clear, with elevations at the inner third of the canal and about the drum-head, like blebs. The drum-head was thick and red, but not perforated. I judged from the appearance that

the exudation had passed through the tissues of the membrane without rupture. At this time there was no pain, but a disagreeable sense of fullness, and the hearing for the voice reduced to minimum. Bone conduction was better than aërial, both sides. No inspection of hearing for watch was recorded.

Letter of advice was given to the family physician, and the remedies used were, first, ferrum phosphoricum and afterward kali muriaticum.

The sixth case after this, January 14, 1890, was one of remarkable interest. The right ear began paining suddenly January 25, 1889. The patient, a young woman of thirty years of age, had suffered for a number of days from influenza, with great prostration, high fever, intense neuralgic pains, which had been treated by the family physician with relief, so that she was able to come to my office. The right drum-head was intensely red, very thick, and bulging throughout its entire contour. But in every other sense she expressed herself as very much better, but felt great solicitude as to the outcome of this attack upon her hearing for the future. This apprehension was contrary to her mental make-up, so she claimed. A decided objection was made to puncturing the membrane, but after three days, no decided improvement taking place, although the redness had disappeared, except at the periphery and Schrapnell's membrane, the patient yielded. After the application of four per cent. cocaine solution for five minutes, a slight puncture was made at the point of greatest pressure. A thin, clear, watery fluid escaped, containing some white flocculi. Ferrum phosphoricum was continued. The next day the general feeling was better. Inflation and suction forced out quite an amount of fluid, with a little mucus. Two days later the incision had healed, and the bulging was not marked. Inflation by modified Valsalva, positive.

This case went on to perfect restoration of the hearing.

On March 9, 1892, she passed through another experience of influenza, which affected the eyes, but made no impression upon the ears.

January 24, 1890, I was called in consultation to a unique case occurring in the person of a gentleman sixty years of age, who four weeks before had had an attack of the grippe, been attended by his family physician, and was considered fairly convalescent, when suddenly he was attacked with a most intense pain in the

left ear. The application of hot water relieved, and occasional pains occurred until last night the pains were so severe that he came to my office. On examination the left drum-head was sodden, outer layer exfoliated; Valsalva's experiment forced out bubbles. The patient fainted immediately after this experience, but so far as I could judge, not from pain, but from severe weakness. *Marum verum teucrium* was advised, with the use of such remedies for acute conditions as might be indicated, and careful attention directed to the nourishment and support of the patient. January 30 the patient was seen at his home, in consultation. Severe neuralgic pains occurred every night, and the latter part of the night was an experience of intense suffering. The drum-head was incised, but no pus escaped, simply a lymphoid fluid. Muriate of quinine was prescribed.

February 3 the incision had closed and gradually the intense neuralgia had returned, this time not immediately relieved by the incision. February 17, *membrana tympani*, the incision closed and the membrane clearing up, inflation moves freely by Valsalva's experiment.

From this time the case went rapidly on to a fair degree of resolution. The unique features of this case were the character of the secretion, which was lymphoid, the relief from the administration of muriate of quinine, the extreme prostration and the intense neuralgia, and, I may say, a good degree of function restored.

April 2, 1891, was called to take charge of Mr. J. B. A., age between fifty and sixty, a strong, healthy man. He came down with grippe ten days before. The left ear was involved day before yesterday. Dullness of hearing, stuffiness, and during the night severe pain. Some drops were used, the nature of which I do not know, which gave temporary relief. On examination the drum-head was thick, bulging, and pink over Shrapnell's membrane. The temperature was about 102°, the pulse varied between 90 and 100. *Ferrum phosphoricum* was prescribed, to be taken every two hours, and in case of pain every half hour in water, and glycerole of *plantago* locally. The next day the temperature was lower, just a shade above normal, and the pulse about 80. The patient more comfortable in every respect, and intolerant of confinement either in bed or upon the lounge.

April 13, patient seen at the house daily until this date.

On the fourth or fifth day of my visits, I found the patient decidedly worse, and on inquiry into possible causes learned that, contrary to my prohibition, he had felt so much better that he went down to the dining room without taking the precaution of wrapping himself, and had experienced a decided relapse of all the symptoms. From that time until this date the prohibition has been carefully observed, one experience of the relapse being enough.

May 1, improved so that the hearing was $\frac{2}{3}$, although not quite as prompt as on the right side, which had not been involved.

May 20, a slight, acute coryza had developed a good deal of solicitude in the mind of the patient, but hearing distance was normal, inflation easy, and no inflammatory symptoms observed.

The noticeable symptoms in this case were the rapid progress of the attack, the bulging of thick membrane, the extreme sensitiveness to cold and exposure, and the complete recovery.

June 17, 1891, Mr. C. C. W., age eighteen, after a sharp attack of influenza with well-defined grippe symptoms, the left membrane sloughed. On examination found the canal moist with whitish pus, and a large granulation mass covering Shrapnell's membrane. Application of eight per cent. solution of cocaine relieved the sensitiveness, and the mass was touched with galvanocautery. Hepar sulphur was given internally every two hours.

June 18, better in every respect. Granulation mass was dry and much reduced. I touched the mass with one drop of solution of persulphate of iron and continued the hepar.

Seen on the 19th, 20th, and 22d. In every respect better. The point where the granulation mass was observed was covered with scales, but the tissues were less sensitive.

June 23, experienced relapse last night at eleven o'clock; acute inflammation has set in, drum-head very red, but not bulging. Ferrum phosphoricum, a powder every hour.

Seen in the afternoon on account of severe paroxysm of pain. Belladonna in solution every half hour in case of severe pain, and muriate of quinine, 1st, every third hour.

June 24th, experienced a bad night, and changed the remedy to ferrum phosphoricum every half hour in case of pain, and hepar sulph. every third hour.

June 25th, severe pain, three o'clock in the afternoon again. Patient sensitive to every slight impression, light, sound, etc.;

belladonna and muriate of quinine, 1st. The belladonna to be given every half hour, and when the patient is extremely intolerant of his suffering.

June 26th, very much better, but extremely annoyed on account of the deafness.

June 27th, both ears annoying him, both drum-heads moist and congested, but he had a very much better night.

June 29th, better, right membrana tympani clearing up; left infiltrated anteriorly, canal narrowed, extremely sensitive. Continued belladonna for paroxysmal pains and hepar at intervals of every third hour.

July 3, has improved in every way, and is leaving the city for his vacation.

October 7, membrana tympani, right and left compressed, but free from congestion. H. D. (watch) $\frac{2}{3}$, with difficulty, right and left, inflation by Politzer, no improvement. Static electricity passed through the eustachian tube, then inflation promptly, hearing $\frac{2}{3}$ right and left.

October 21, still acute catarrh, but hearing normal.

The interesting points in this case are the rapid resolution of the suppurative process with the granulation, the extreme sensitiveness, suppressed exudation, relieved by muriate of quinine, the rapid recovery, and the complete restoration of the function.

July 13, 1889, Mr. J. B. W., age sixty, had the grippe April 6. Sudden attack followed by severe pain in the right ear, which was described as fearful for more than a week; then the flow of pus from the ear, with relief. The right ear completely closed by granulations, which were curetted and touched with saturated solution of bichromate of potash. Calcareo phosphoricum internally, and plantago locally in case of soreness.

July 24, gained rapidly under the above treatment, but the application of the bichromate has produced the effect which I have frequently observed, extreme sensitiveness and excoriation of the tissue. Hepar sulphur given internally.

July 27, gaining nicely. Perforation superiorly and inferiorly, inflation by Politzer.

July 29, no pus, perforation clearly defined, inflation satisfactory. Silicea 7th.

August 13, mucoid pus appears at the perforation, and the general character of the mucous secretion from the nares and

pharynx is thick yellow masses. Kali sulphuricum, 6th. Not seen until September 11. Perforation above only.

By Gruber's method a solution of menthol in paraffine was forced to the pharynx and kali sulphuricum continued.

September 18, perforation was very small, and suction with Siegle's otoscope brought a little pus from the tympanum. Hepar was used as before, and the kali continued.

A week later the condition was much the same, treatment the same.

October 5, perforation was a mere point.

Same method, and silicea was given.

October 12, the perforation still a mere point, but the superior wall of the canal was bulging just at the juncture of the drum-head. Hepar 3d internally every five hours.

A week later the condition was much the same, except the bulging was a little less. Solution of aristol in paraffine was forced through to the pharynx.

October 23, bulging continued. I incised the roof of the canal and continued the hepar.

November 12, the treatment has been the same to this date, but to-day instead of Gruber's method with the aristol, I forced the aristol from the meatus to the pharynx through the eustachian tube, and gave calcarea fluorata.

December 3, the above treatment was continued with good results.

December 21, in every respect better, no pus, no mucus, perforation very small, and the aristol solution passing through readily. Calcarea fluorata continued.

January 11, condition the same.

February 14, drum-head covered by a small scale, and on inflation a dry perforation whistle is heard. Silicea.

March 15, perforation nearly closed.

April 18, both perforations closed, and the patient instructed in the art of massage, that is, violin. Silicea 7th.

October 7, membrane bulges by Valsalva's experiment both anteriorly and posteriorly at the point where the new plastic tissue is the thinnest. The patient has practiced massage with the 'cello, and is delighted with the degree of hearing which he has conserved by the practice.

The interesting points in this case are the severity of

the initial experience, the fact that the treatment which he received was equivalent to neglect, the case yielded at once and readily to local treatment and to internal medication, the invasion of the tissues of the roof of the canal following the periosteum, the relief by incision and flooding with antiseptic applications, complete repair, the interesting appearance of the drum-head after repair, and the satisfactory audition secured are worthy of note.

December 27, 1891. Mr. S. B., aged forty-five. After a well-defined experience of the grippe, the patient was taken suddenly with acute otitis media. Under the care of his family physician this was not relieved by the various remedies given, and on visiting him at his residence, no relief followed. Examination showed the entire canal to be somewhat swollen, decidedly infiltrated at the inner third, so that it was difficult to define the limits of the canal and drum-head. The latter was thickened, infiltrated, and bulging irregularly; no one point of marked prominence. The extreme suffering which had occurred in the night was quite as much of a neuralgic type in the face and head, back of the neck, as of a paroxysmal nature, so that any attempt at relief by incision was postponed to another day.

December 28, he seemed better, but as no transudation through the tissues of the drum-head occurred, muriate of quinine was given, with apparent relief. I did not see him until Friday, January 1; the conditions remaining the same, the muriate of quinine, eight per cent., was used locally, and a paracentesis knife passed through two prominent points in the drum-head. A thin, watery fluid escaped, and relief followed until Thursday, January 7; the experience of the night previous was simply intolerable, and on the 7th an operation of the same character was made. This was followed by relief, and after one other consultation, the patient remained under the care of his physician until January 22, 1892.

The right drum-head was thick, red, infiltrated, but no evidence of moisture, and an attempt was made to restore the function by massage. He was under treatment until March 19, first daily and then twice or three times each week. The hearing improved so that it was about $\frac{3}{20}$, right and left, for the watch, and for the voice about $\frac{3}{8}$. For conversation near at hand the patient experienced no difficulty.

October 17 the patient had a relapse while in Switzerland, and was treated by Dr. Nager. Hearing distance now, right $\frac{4}{20}$, left, $\frac{3}{20}$. Under massage and kali muriaticum he improved so that on September 19 the hearing was $\frac{5}{20}$, right and left, right drum-head pinkish and thick, the left thick and shining.

The patient was satisfied with the degree of hearing secured, and, suffering from other difficulties, decided to abandon the treatment.

The items of interest are the immediate relation of the influenza as the existing cause, the relief from paracentesis with exudation of lymphoid fluid and little or no purulent process, the recurrence of the pain when the incision healed, the second relief from incision, with the same character of fluid, and the final result, the $\frac{5}{20}$, right and left, satisfactory to the patient, but unsatisfactory because the massage was not continued sufficiently to demonstrate whether any additional function could have been secured.

The following remarkable case is the only instance in which I have seen distinct lesions of the internal ear as a sequela of grippe:

Miss H. A. P., age fifty-seven, in good general health except this remnant of the grippe. Examined April 17, 1893. Two years ago the usual symptoms of grippe were followed by pneumonia and dysentery. A subjective noise set up in the left ear. Drops were put in both ears, and it was then found that the left, alone, was deaf. The next symptom reported was vertigo. The physician in attendance said it was due to congestion of the liver, but later on the patient was seen by Dr. Buck, whose diagnosis was otitis interna, and the prognosis unfavorable. He reported that there was no auditory power at that time. The symptoms, as described by the patient, were that on turning to the left side, the vertigo was so intense that not only the bed, but the entire room whirled; she, however, was unable to describe the plane of the gyration. After the vertigo there was an effort to vomit, but nothing but froth was ejected, and for months afterward any turning upon the left side would cause the vertigo, and instinctively the patient turned back. Even now, there is timidity about turning suddenly upon the left side. The appearance of the ear is

quite normal. The hearing for the watch is —20, right side $\frac{20}{0}$ acute. Under treatment with the phonograph, vibrometer, and reed organ, the subjective noises have entirely disappeared, and the hearing is now, right $\frac{20}{0}$, left $\frac{0}{0}$.

The first attempts at massage developed discomfort in the occiput, similar to that of eye strain, and onosmodium was given. A more prolonged treatment a few days later produced the same discomfort, and also distress along the sympathetic, involving the supply to the ear and to the solar plexus so much that the sitting was abandoned. Subsequent sittings of the same duration, and even longer duration, have not produced this effect, and each day the same tests with tuning-fork and organ make more impression, so that the sound appears nearer and nearer with each successive treatment.

The case is interesting, as I say, as it is the only one in which the internal ear was involved entirely independent of the middle ear. It was undoubtedly a clear case of otitis interna exudativa serosa, as a consequence of the grippe.

In order that this account of cases may not be tedious, I will simply refer to five instances occurring in the persons of medical men who, by personal experience, are prepared to sympathize with any future patients who may have otitis as a consequence of the grippe.

One case had passed through the ordeal some two years ago, and suffered from the perforation of the left drum-head in the region of Shrapnell's membrane. At the time that he called on me he was suffering from most extreme prostration, rapid, feeble pulse, temperature normal, the drum-head ruptured and the middle ear filled with a muco-purulent secretion, mild in character, profuse in amount. The entire canal and tissues of the drum-head were so extremely sensitive that it was almost impossible to resort to any local cleansing. I, therefore, applied four per cent. solution of cocaine in oil, and after ten minutes' sitting was able to clear the canal and draw out from the cavity of the tympanum all the secretion present at the time. Hepar sulphur relieved the extreme sensitiveness, and ferrum phosphoricum was very valuable in reducing the engorgement of the tissues, especially that about Shrapnell's membrane. At the next sitting the sensitiveness was such that he could tolerate a little more manipulation.

I then passed from the meatus to the pharynx a solution of calendula in paraffine oil. The next day the relief had been so great that the same procedure produced no suffering, and the repair of the drum-head went on rapidly, with restoration of function to a degree equal to that which had existed since the previous attack.

A young medical student who had been under my observation for over four years for a chronic suppuration which had existed from childhood, and had been cured with formation of a neoplastic membrane sufficient for fair function, had an attack of the grippe with earache one night, presented himself the next morning with high temperature, rapid pulse, haggard appearance, with extreme suffering, saying that the pain came on about eleven o'clock at night, he suffered intensely until about four, then a discharge came freely from the ear, giving some relief, and he had hastened to me for examination. The membrane which had formed in the place of the drum-head had entirely sloughed in this brief space of time, leaving a large lenticular opening, exposing the cavity of the tympanum, which was filled with a muco-purulent secretion of an acrid character.

This case was treated in a similar way, with calendula and afterward with trituration of thuja on account of the tendency to exuberant granulation, and at present writing the membrane has been restored with the exception of a slight perforation or slit, not larger than the head of an ordinary pin.

Another medicus had suffered through a period of about two weeks with the remnants of acute catarrhal influenza, succeeding an experience of about forty-eight hours of intense suffering, fever, backache, general neuralgia, etc., with extreme prostration. An experience of twenty-four hours of severe pain in the ear was followed by discharge, and on examination the inner third of the canal was found to be extensively infiltrated, the drum-head thick, red, but bulging over the entire area of the flaccid membrane. This was perforated at its most depending portion, and was in a fair way to slough entirely. I therefore applied cocainized oil until he could tolerate manipulation, and then evacuated the contents of this sac as fully as possible by pushing it backward and upward. Ferrum phosphoricum, hepar sulph., and silicea were the remedies used, and the young man has an ear with which he may be able to hear fairly in practicing auscultation. My impression

is that there was a healthy history in childhood which predisposed to this experience.

During the past month I have had occasion to see two physicians, residing at different points in this State, who had a very similar experience.

The catarrhal inflammation accompanying the grippe extended almost at once to the middle ear, in one instance involving the right ear, and in forty-eight hours after the left ear, both being ruptured in the line of the concentric fibers of the drum-head, and both making very rapid resolution without loss of function, and without apparent scar. The remedies which were influential in both cases were gelsemium and ferrum phosphoricum.

In the second case, only one ear was involved, and the restoration equally unique.

The lesson to be learned from the experience of these five medical gentlemen is that a "stitch in time saves nine." I am thoroughly convinced that if these cases had been allowed to linger, they would have passed into an experience of chronic suppuration, with large loss of tissue and consequent impairment of function.

MALIGNANT GROWTHS IN THE LARYNX.*

BY H. F. FISHER, M. D., NASHVILLE, TENN.

Malignant growths in the larynx are comparatively rare, and the literature upon the subject so limited that a report of every case is justified. Although the treatment in this case did not prevent death it proved palliative, and being one of the few cases treated with homeopathic remedies should be of interest to us. This, therefore, is the only apology I have to make for encroaching upon the time of this body.

Cancer of the larynx was brought prominently before the public a few years since by the sufferings and death of General Grant of America, and Emperor Frederick III. of Germany. These cases received a great deal of attention at the hands of skilled specialists in all countries.

These malignant growths are divided into two classes, sarcomata and carcinomata (epitheliomata being classed with the latter); but it requires microscopic examinations to determine the difference; and as the methods of treatment are essentially the same, the distinction for other than pathological research is unnecessary.

Statistics.—Fauvel found 7 sarcomata in 300 cases of laryngeal growths; Gurlt found 1 case of laryngeal sarcoma in 848 cases of this morbid growth in the body. Bosworth, on p. 743 of his excellent work, states: "I find recorded in medical literature 47 cases of laryngeal sarcomata," and admits that in his extensive practice he has had only 1 case. Gurlt in 11,131 cases of carcinomatous

* Read before Homeopathic Congress, Chicago, 1893.

growths found 63 in the larynx; Lebert found 3 cases in 9,118; Baker found 3 in 500, and Winnerwarter 1 in 548 cases. Mackenzie, London's famous specialist, saw 53 cases of carcinoma of the larynx, hence it is readily seen that carcinoma is nearly six times as frequent as sarcoma.

I present herewith a report of the case which came under my treatment, for your consideration.

CASE. Rev. C., æt. fifty-two, presiding elder: light hair and complexion, blue eyes, 5 feet 5 inches in height, weight normally 130, now 122 pounds, consulted me September 18, 1890, for throat trouble, stating that he feared he would be compelled to leave the ministry on account of his voice failing. He had been examined by prominent specialists in St. Louis, Fort Worth, and Waxahachie; two diagnosing laryngeal tuberculosis, and one chronic catarrhal laryngitis.

History.—"My throat has been troubling me for nine months, at which time I found it difficult to preach my usual time, and, after exertion, difficulty in breathing. Seven months ago had la grippe, since which the trouble has developed more rapidly; now get out of breath easily; have to exert myself a great deal to preach; have a burning, sticking pain, as if caused by a splinter, extending from the throat to the right ear when swallowing; hoarseness, voice fails me when preaching; cold air in the throat or on the neck produces cough; swallowing difficult; liquids especially go the wrong way and regurgitate through the nose; pain when swallowing, like rubbing two rough surfaces together; at times, a little itching, hurting pain in throat ushers in a spell of coughing, terminating in vomiting, which produces intense pain; voice rough and hoarse; cough a great deal, raising a frothy white or clear starch-like mucus; expectoration profuse; occasionally quite nervous; when talking of delicate subjects become almost uncontrollable; five years ago had a nervous attack in the pulpit, from which I am entirely recovered. General health always excellent, weight has diminished some recently in spite of good appetite; bowels regular; stool and urine normal; no particular thirst nor desire for special articles of food; skin normal; cheerful temperament. Smoke three to five cigars a day; never use a pipe nor chew; do not use liquors or nar-

cotics ; am afraid it is, or will result in, a cancer." No history of tuberculosis, syphilis, or cancer obtainable.

Examination of the nose reveals a chronic catarrhal condition ; both inferior and middle turbinates hypertrophied, especially in the left nostril ; slightly parted lips indicating some mouth breathing ; tongue slightly coated, white anteriorly but heavily posteriorly ; breath not offensive ; gums normal ; teeth in good condition ; uvula elongated, pointed, and flat anteriorly ; much congestion of a violet-red color in the pharynx, naso-pharynx, and larynx : pharynx very sensitive ; laryngoscopic and rhinoscopic examination completed under cocaine, but even then the gagging continued so that examination was not entirely satisfactory. The following conditions, however, were noted : Larynx congested ; vocal cords, especially the right, hyperæmic and soggy ; glottis and epiglottis less mobile than normal ; right ventricle congested and apparently on a higher plane than the left ; this congestion extending up the false bands and epiglottis ; pain intense when gagging ; vocal cords straight and smooth, having no gnawed appearance as in tuberculosis ; temperature normal ; pulse seventy-six. The appearance of the pharynx, naso-pharynx, and larynx resembled an acute exacerbation of chronic catarrhal laryngitis, and having recently been exposed, in damp, cool weather, sleeping in strange beds with inadequate covering, it was rather difficult to make a clear diagnosis. Bosworth, p. 753, says : "There is nothing in the gross appearance of carcinoma in its earlier stages which renders it possible to make an absolutely definite diagnosis. . . . It is to be borne in mind that the disease consists essentially in cell infiltration which burrows . . . into surrounding parts." Expectoration of a clear-starch, lumpy character, which was raised with little effort, some ptyalism of a stringy, tenacious character. The burning, sticking pain extending into the ear was the most persistent symptom ; no thirst nor restlessness ; "sleep as calmly and peacefully as an infant." Face very slightly flushed ; eyes bright and pupils dilated slightly.

Treatment.—With this picture of the case before me, the first \mathcal{R} was belladonna and kali bichr., two hours apart ; cleansed the nasal cavities, pharynx and larynx, with spray solution.

\mathcal{R} Sulpho-carbolate of soda 3 j
Aqua Oij

M. Sig. Use two ounces as spray for cleansing. After using this solution applied oil, spray.

| | | |
|--------------------------------|-------|-------|
| ℞ Eucalyptol....(Sanders)..... | gtts. | x |
| Terebene.... | gtts. | x |
| Menthol ... | grs. | viiij |
| Albolene..... | | ℥ ij |

M. Sig. Use after aqueous solution, q. s., to protect the parts.

Next day, against my earnest protestation, he attended a camp meeting and got thoroughly chilled and wet while there ; in spite of this, reported better on next visit, five days later. The burning, sticking pain was still troublesome, and the throat remaining decidedly congested, continued belladonna and substituted merc. biniodide 3x for kali birchr.; used same spray as before. Two days later he went to fill another appointment, and on September 27 I sent per mail belladonna and argenti met. 4 x ; the latter for the voice, which cracked easily. Eight days later he wrote for more medicine, complaining that the burning pain resembled that produced by red pepper.

℞ belladonna and capsicum ; but on October 10, on examination of the throat, again prescribed belladonna and argenti met., using spray as before. He stated: "Those little pills [belladonna] give me more relief than anything else so far." On October 14, having been exposed in cold, wet weather, and complaining of cold and rheumatism, gave rhus tox. 3 x, continuing this remedy until November 5, with the addition of kali bichromic. the first week for the expectoration, and argenti nitric. for the pain the remainder of the time. On this last date discontinued everything but argenti nitric. and the sprays, he having reported that the cold and rheumatism had disappeared, and the burning, sticking pain was much relieved. November 22 he again reported improvement in the pain ; said the expectoration had again become lumpy, clear, starchlike, tenacious, irritating, and difficult to raise ; no blood nor pus streaks in sputa ; voice weaker. ℞ naphthalin and argenti met.

November 26, reports the cough no better ; more hoarseness ; great difficulty in talking ; scraping in the throat, with the burning, sticking pain more prominent. ℞ Merc. jod. cum kali jod. and argenti nit. December 11, reports better, except the pain and general weakness ; up to this date he had lost thirteen pounds, although the appetite was good ; continued argenti nitric. He left next day for Corpus Christi to try change of climate, all the while using the argenti nitricum four times daily. While in Corpus he "lived on oysters, fish, and the best

obtainable," gained three pounds the first two weeks, but lost four the remainder of his stay, returning home February 11, 1891. From this date I visited him at his residence almost daily until the middle of April. He looks fatigued, wearied, disheartened, and has abandoned all hope of recovery, refusing absolutely any operative interference.

Is very weak, voice almost lost ; some dyspnœa upon exertion ; drowsy ; rests well and appetite good, but afraid to eat on account of the intense pain when swallowing ; pharynx and larynx congested and angry looking ; right side of epiglottis and epiglottic fold, right ventricle, and vocal cord congested, swollen, nodular, and nearly immobile ; the point on the fold beginning to ulcerate freely ; the left side of the epiglottis and fold infiltrated, smooth, bright red, the infiltration resembling œdema ; no tendency to dyspnœa except when exerting himself ; cervical glands enlarged ; larynx extremely sensitive to external pressure. Profuse expectoration of greenish-yellow, pus-streaked saliva, with a fetid, sweetish odor, difficult to raise. *R* Stannum met. and phosphorus, and

- R* Sodium biboratus (borax) 3 j
 Aqua Oij
 M. Sig. Spray larynx to cleanse thoroughly, then apply
- R* Cocaine grs. x
 Aqua ʒ ij
 M. Sig. Apply to larynx before eating.

This gave great comfort. Zinc sulphate, grs. ii ; argent. nitric., grs. iv ; carbolic acid, gtts. iii ; sodium chloride, grs. v ; et aqua, ʒ j were more irritating than the above *R* for spraying, hence continued its use ; continued stannum and phosphorus one week, then on account of the livid color of the throat and slight hemorrhage with constant picking at the nose, gave arum triphil. one day. February 20, the *R* was hepar sulphur and kreosotum for the entire condition ; February 23 began local application of iodoform, after spraying first in ether which caused much irritation, and subsequently applying the powder with the brush directly to the parts. Afterward used charcoal and sulphur triturated together, which seemed less irritating and more effective ; these applications were continued until death relieved him. March 12, the *R* was alumina, for very obstinate constipation, and nitric acid for the pain ; the latter seemed to aggra-

vate. Argentinum nitric. was substituted on the 14th and continued until April 29, he having gone from the city to attend to important business. April 29, R hepar sulphur. He was now very weak, unable to leave the bed, bowels loose but controllable, voice lost; cancerous cachectic look; skin dry, hot, harsh; face haggard; aged perceptibly, and demise predicted early. Gave aconite for fever; natrum mur. for chilly sensation about 10.30 A. M., and arsenicum. On May 18 R digitalis and ammonium for weakened heart action.

Result.—Death from exhaustion May 21, 2.30 P. M.

Remarks.—My records do not show that arsenicum was given before May 13, but I am firmly under the impression that it was tried early and no record made. My impression is that it aggravated and was discontinued. However, if arsenicum was not used, it should have been given a trial.

About February 15 he coughed up a piece of cottonwood toothpick about three-sixteenths of an inch long; he and the family assert that he had not been using that kind of a toothpick for over a year, and he firmly believed it had something to do with his malady.

I do not ascribe the trouble to this cause, for, upon microscopic examination, the wood did not show any signs of having been imbedded in tissue, which would have been the case had it remained there over a month. In March he had sputa examined microscopically for tuberculosis, desiring to test the Koch treatment, if tubercle bacilli were present; careful examination by a competent microscopist gave negative results; this same gentleman was requested to examine a second time for carcinoma or sarcoma; but being called away failed to do so.

Owing to the unintentional oversight of a son, I failed to receive a message from my patient, stating that I could have his larynx after his death for examination; the message was delivered after corpse was dressed for burial, and in deference to the family gave up my fond hope of an examination of it *post-mortem*.

Diet.—Milk, buttermilk, cream, ice cream, custards with-

out sugar, raw eggs, oysters, broths, and easily digested foods were taken with relish ; these articles were more easily swallowed if very cold ; cracked ice was used to quench thirst.

Indications for the remedies.

Aconite.—Face flushes up when rising from recumbent position ; dryness in the mouth ; thirst ; burning constriction in the larynx ; soft palate, uvula, fauces, and pharynx dark red ; weak voice ; skin hot, dry ; face hot and flushed ; feverish ; pulse, quick and hard. (Given only a few days before death.)

Alumina.—Rectum inactive ; soft stool, requires much straining ; stools hard, like sheep's dung, scanty ; larynx more troublesome when constipated. (Relief after a few doses.)

Ammonium carb. — Accumulation of mucus in the larynx ; great oppression in breathing ; palpitation of the heart ; feels as if dying ; pulse, small and quick. (Given with digitalis to relieve the dyspnœa and stimulate the heart's action.)

Argentum met.—Neck stiff, swallowing difficult ; sticky, tough saliva ; viscid, gray, jelly-like mucus easily hawked up ; throat feels raw and sore when coughing ; hoarseness of professional speakers ; a dull cutting, which becomes a stitch causing fits of coughing ; easy expectoration of white, thick mucus like boiled starch. (Used this remedy in the beginning and subsequently, but seemed to get no result.)

Argentum nitric.—Sickly appearance ; white tongue ; ptyalism ; tenacious mucus in the throat, causing hawking ; soreness ; sensation as if a splinter were lodged in the throat when swallowing or moving the neck ; uvula and fauces dark red ; burning in the throat. (This remedy seemed to give most relief to the burning, sticking pain in the larynx.)

Arsenicum.—Great emaciation ; restlessness and anxiety ; weakness and prostration.

Arum triphil.—Congestion ; soreness ; dryness ; burning pains and ulceration in the throat ; constant picking of the

nose. (Given one day only, and with relief of the nasal symptoms.)

Belladonna.—Eyes sparkling ; pupils dilated ; swallowing difficult ; pain extending from the throat into the ear ; congestion of the pharynx and larynx ; pain in throat comes and goes suddenly ; great inclination to sleep ; aggravation from draught of air and in changeable weather. (For a time gave considerable relief to the pain and other symptoms.)

Capsicum.—Burning in the throat as if from red pepper.

Digitalis.—Heart's action feeble, irregular ; pulse very slow.

Hepar sulphur.—Sticking in the throat extending to the ear, worse on swallowing ; sensation as if a splinter were in the throat ; suppuration in the larynx ; weakness of the larynx ; cannot speak aloud ; cough caused by cold air in the throat. (This remedy with kreosotum gave considerable relief to the pain and seemed to control suppuration to some extent.)

Kali bichromic.—Hoarseness ; accumulation of tough stringy mucus in the larynx ; expectoration stringy ; tissues in the throat dark red and livid. (Loosens the mucus and assists expectoration.)

Kreosotum.—Pale face ; tongue coated white ; putrid odor from the mouth ; roughness of the throat ; hoarseness ; shortness of breath ; sticking in the larynx. (Seemed to work in conjunction with hepar to control pain and suppuration.)

Mercurius biniod.—Much phlegm in the throat ; congestion of the tissues in the throat. (Always given in conjunction with belladonna.)

Mercurius jod. cum kali jod.—For the cough that would not yield to argentum met. (A failure.)

Naphthalin.—For the clear, starchlike mucus difficult to raise. (This remedy acted well in freeing the mucus.)

Nitric acid.—Suspecting specific taint and for the burning, sticking pain ; sallow complexion ; purulent expectoration. (Aggravation caused by the 3x in water.)

Phosphorus.—Expectoration of yellowish-white mucus,

difficult to detach. Cough causing more pain ; non-assimilation increased salty saliva.

Rhus tox.—Cold taken in damp, cold weather ; rheumatism worse left side ; “ can predict storm several days ahead of time ; ” worse in bad weather.

Stannum met.—Efforts to expel mucus in throat cause vomiting ; hoarseness ; ulceration in right side of throat ; roughness in larynx ; scraping cough with greenish-yellow expectoration ; extreme weakness and prostration ; must sit or lie down continually.

UNSETTLED QUESTIONS IN OPHTHALMOLOGY.

BY HAYES C. FRENCH, M. D.

The fact that there are questions in regard to the morbid anatomy of the eye, which, after years of discussion by the best minds of the profession and during which an equal amount of exhaustive study and practical experimentation has failed of decisive results, is sufficient proof that the road to ultimate truth is often long and thorny, and that the modicum of settled fact in regard to many important questions in which the modern specialist may securely bask is relatively small. The existence and treatment of heterophoria, and its relations to ophthalmology and diseases of more remote organs, have for almost a decade kept the best authorities of two continents about equally balanced as to whether the question has a legitimate place in our discussions, and this train of maladies has any vital bearing upon the organic integrity of the eye, or whether any attention to the subject of heterophoria after all is not evidence of an unsound mind and morbid imagination. After an exhaustive study of heterophoria for years, during which he brought to the support of his investigations the positive proof of what he claims as hundreds of successful operations, based upon his theoretical deductions, Stevens at last gained a semi-respectful, though questioning consideration for his claims, and, especially in the United States, a widespread and thorough trial of his system of treatment, based upon his theory of the disorder. His converts during these years of trial have numbered

some of the best minds of both continents, and their widely divergent opinions as a result of their investigations is another striking proof of the uncertainty of the most learned deductions in the domain of eye pathology. A careful perusal of Stevens' work will convince any fair mind of the careful and conscientious labor he has performed in his chosen field, yet, to adopt *in toto* his deductions would be to perform some degree of tenotomy upon the eyes of about fifty per cent. of the patients presenting themselves for treatment. Stevens' excessive enthusiasm, and what is believed to be the unwarranted number of his operations, have so biased the minds of many of our leading ophthalmologists against the whole subject as doubtless to lead them into grave error in the opposite direction.

The careful examination of many hundreds of eye cases, in which there was a greater or less degree of heterophoria with no noticeable effect upon the normal function of the eye, has convinced the writer that indiscriminate operations upon the muscles of the globe, however trivial the changes produced, can but work grave, if not irreparable mischief to the victim of such interference. On the other hand, out of these many cases, with no clearly defined reason for the exception, there will be found a certain percentage of eyes that will receive almost magical benefit from a graded tenotomy; and there can be no doubt of the benefit to a still greater number to be found in judicious prism practice, combined in some cases with a careful use of galvanism. When any degree of heterophoria persists in a case that has for months resisted all other treatment, including the development of the weaker muscles by prism practice, a carefully graded tenotomy will usually yield most gratifying results, and is frequently the only means of cure. Those who from mental bias, even after the many failures and numerous injuries that may have resulted from excessive zeal on the part of disciples of Stevens, have abandoned entirely any effort to correct heterophoria, must have unconsciously imposed upon themselves many mortifying failures as the price of their

proscriptive policy, and frequently their despised colleagues have heaped a rich reward in professional reputation from this self-imposed defeat.

Cases.—In the effort to draw from these conflicting opinions some grains of permanent practical truth, we will draw at random from our case book examples that seem best suited to illustrate the most common difficulties which beset this much mooted subject, and perhaps throw some light upon the path to ultimate success. The first case, that of a middle-aged married lady with an esophoria of 2° on accommodation, who had spent a year experimenting with internal remedies, glasses, galvanism, and bad promises to the tune of between three and four hundred dollars, came to us with a hopeless air of inquiry. The first treatment with prisms showed some improvement, and at the end of three weeks she was entirely restored, and her eyes, which for several years she had been unable to use for more than five to ten minutes consecutively without pain and headache, she could use for an almost indefinite period without the least sign of discomfort. Although two years have elapsed since this cure she has never returned for treatment but once, and then more from dread of a recurrence than from any actual relapse; and the single treatment was sufficient. Had fortune kept her constantly in the hands of ultra pessimists as to the doctrines of Stevens, she would have doubtless been indefinitely victimized both in regard to her eyes and her pocket.

Case Second is that of a vigorous young lady of twenty, with robust general health, but who for over eight years had been the rounds of the specialists seeking relief for an eye trouble that had made it impossible for her to use the eyes for more than a few minutes at a time without great pain both in the eyes and the head. She had an exophoria of 4° both on accommodation and for distance, and had never suffered from diplopia. The internal recti muscles were stimulated by prisms till convergence equaled 60° , with no beneficial effect upon her vision or reduction of the exophoria. A partial tenotomy of one external rectus at

once improved her vision materially, and the prism practice was continued two weeks longer, when a very careful operation was performed on the opposite externus, resulting almost immediately in a perfect and permanent cure. She can now, after two years have elapsed, use her eyes almost indefinitely without any inconvenience. If this case had occurred in my practice previous to acquaintance with Stevens' work, I would have pronounced it asthenopia and recommended rest, and consoled myself in defeat with the unflattering unctio that she could do no better elsewhere. It does not seem to the writer that there is a single element of proof wanting to show that this case would have been hopeless without the graded tenotomies employed. While recording successes, we are too apt to deprive our professional brethren of the often more helpful results of our failures. Such a one, at least in part, was Case Third, a middle-aged literary man, thoroughly up in the latest technology of optics, accommodation, and the co-ordination of the muscles. He had for two years made a constant study of his own case, and knew perfectly the nature and philosophy of his heterophoria, and had tried every form of spherical and compound glasses, with and without prisms, and prisms alone, yet all without any beneficial result. The phorometer showed an exophoria of 4° for distance and accommodation. He owned a full set of prisms, which he had used advisedly for over a year, and had acquired an easy adduction of 90° , yet without the least effect either upon the exophoria or vision. A tenotomy of the externi had been advised by my predecessor, and he came to me anxious for the operation. After repeated examinations, and the trial of every other conceivable agent and means, I at last divided all the central fibers of one externus, with absolutely no results, and in two weeks from the first performed the same operation on its fellow of the opposite eye, with the same result as before. Becoming desperate in his desire for relief, he urged the immediate trial of a more radical operative measure, and after waiting two months I severed one externus entirely from its scleral attachment, producing homonymous diplopia at a distance, which was corrected by

a 4° prism, and which in a few weeks passed away entirely, leaving an esophoria for distance of 3°, the exophoria of accommodation remaining the same as before the operation. He acknowledges some improvement in his reading power, which he says compensates him for all the inconvenience of the surgery and the annoyance of the temporary diplopia, and even with these slight advantages it is not a procedure that we shall be anxious to repeat. In the face of the overwhelming tide of adverse and scornful criticism, we venture these humble proofs that within clearly defined limits, graded tenotomies of the ocular muscles may become indispensable to the successful treatment of many distressing eye troubles.

It is safe to presume that there are few recognized remedial agencies in the treatment of the eye, that have received any serious and extensive indorsement from prominent ophthalmologists, but will be found in the end to contain some factors of permanent merit; and even jequirity, which flashed with meteoric splendor in the therapeutic arena, to enjoy the superlative eulogy of the oculists of two continents, only to sink again within a few months into total oblivion, has in the last few months been resurrected into new life, on the plane of a more rational application. In the *Ophthalmic Record* for January, 1892, Dr. R. C. Hodges records the most satisfactory results from the use of a greatly reduced preparation of the jequirity, stopping decidedly short of the violent inflammation which has hitherto been considered necessary in the cure of trachoma by this powerful agent. A preparation of the agent, two or three years old, which was supposed to have lost its strength by age, was used in solution of the infusion 1 to 3 of water, of which he says: "the infusion was dropped into the eyes daily for seven weeks, every day bringing marked improvement in condition, until the conjunctiva became smooth and normal." He reports the same result in two other cases of trachoma.

THE EFFICACY OF THE VIBROMETER IN AP- PLYING VIBRATORY MASSAGE IN AURAL DISEASES.

BY HENRY F. GAREY, M. D., BALTIMORE, MD.

Since presenting my paper before the American Institute, in June of last year, on Vibratory Motion as a Method of Massage in Aural diseases, I have been using an instrument, specially devised for that purpose, called the vibrometer. This instrument is in shape like a banjo, and has four strings stretched across its length resting on a bridge, which sets upon a diaphragm. On each side, elevated above the diaphragm and supported by posts, are two horizontal bars, which support the mechanical appliances used for producing the various vibratory motions. This consists of what is called a yoke, in which revolves a shaft connected with the electro-motor by pulley wheels and a belt. Behind the diaphragm is a shallow air-tight compartment, leading from which are rubber tubes that are inserted in the external auditory canal during treatment; consequently any vibratory motion of the diaphragm, which must necessarily be an inward and a correspondingly outward movement, would be exactly reproduced upon the membrana tympani, as the confined air, not being able to escape, will undergo an alternate condensation and rarification in the external auditory canal.

Every vibratory movement of the strings of the instrument is communicated to the diaphragm by means of the bridge upon which it rests. These strings, by varying their tension and length, can be regulated to give a high or low

rate of vibration as desired ; for instance, the heaviest string, left at its original length, adjusted to a slim tension, may make about fifty vibratory motions to the second ; while the lightest string on the instrument, adjusted to a high tension, and clamped down to one-fourth its original length, would probably make three thousand vibratory motions to the second.

In the center of the diaphragm is an attachment which works on a lever, and when hit by the cam on the revolving shaft, lifts the diaphragm to a considerable extent, causing a powerful effect on the membrana tympani. This attachment can be adjusted at four different leverages, which causes a modification or increase of its intensity, and can be regulated at from one to twenty-five vibratory movements to the second. This is only used in very bad cases, and for not more than five minutes continuously.

The instrument which I have been describing is an improvement on the first one manufactured, and, as far as I know, is the only one which offers the same facilities for applying this method of massage. The class of patients in my experience who are generally benefited from the first, are those in which the mucous membrane lining the tympanic cavity and eustachian tubes is in a hypertrophic condition. The membrana tympani is depressed, opaque, and thickened. They usually complain of a stuffed sensation in the ears, with a great deal of tinnitus aurium, and that their hearing is worse during a cold. In cases where the mucous membranes are atrophied, with a large external auditory canal perfectly dry and eustachian tubes patulous and generally very little tinnitus, this or no other treatment has done very much good in the majority of cases, and in looking over my records I find that only about five per cent. have been relieved, while in the before mentioned cases the good results reach at least seventy-five per cent. In treating persons I always select the rate of vibration which corresponds in pitch, if possible, to that caused by the diseased condition of the ears. If there is no tinnitus to guide me, I find whether the patient can hear a high or

low sound better ; if it is a low sound, a high rate of vibration is used in treatment, and *vice versa*. A point which I would like to explain here is this : It is not necessary that the sound from the instrument should be of the same quality of the tinnitus experienced by the patient, but merely the same pitch ; for instance, if a banjo, where one of the strings was adjusted when sounded to produce a certain note, and a musical instrument of any other kind, whose quality of tone was entirely different, was made to sound the same note in a room, the string on the banjo would vibrate in sympathy, which has been proven by experiment ; any other note, no matter how loud, would have no effect. Another point is in the way the strings of the vibrometer are set in motion. On the revolving shaft is a wheel, projecting from which are metallic picks, which hit the string it is adjusted over. It does not make any difference in the number of vibratory motions per second whether the string is hit fast or slow, but at the time the string is first hit the intensity is greater than it is just before being hit again ; and as the motion of the wheel is perfectly rhythmic, revolving so many times to the second, it has just as good an effect as if the intensity during the fraction of a second did not vary at all. The idea of using vibratory motion, as I have said before, originated within my mind some years ago, and later was put into practical operation, and, as far as I know, I was the first to lay before the profession, in a scientific manner, this method of massage.

I have found that when two of the strings upon the vibrometer were regulated in such a way that when both were set in vibration, at the same time producing the sensation of a harmonious sound, the effect in some cases on the tinnitus was especially beneficial, relieving where the various kinds of vibration produced by a single string failed. Subacute cases of deafness accompanied by tinnitus aurium are quickly relieved, as the following case will illustrate :

Mrs. M., young married lady, age twenty-six, called at my office April 1, 1893, complaining of partial deafness and tinnitus

aurium. She had a stuffed sensation, or as if cotton had been packed in the external auditory canal. She says the tinnitus was so annoying as to prevent sleep. On examination found considerable retraction of the membrana tympani, and hearing for the watch on the right side five inches, on the left, seven inches. The eustachian tubes were partially closed, which made inflation somewhat difficult, giving slight relief. I used several of the vibrations on the different strings without immediate benefit (April 4).

She came again, and reported that no improvement had taken place. I again inflated her ears, after which she sat down at the vibrometer. The central attachment was used with considerable force continuously for four minutes, after which she declared that the tinnitus had entirely ceased in the right ear and greatly modified in the left, the hearing for the watch had increased for both ears to fourteen inches, and the stuffed sensation had almost entirely disappeared. On inspection of the membranæ tympani, found them comparatively very slightly retracted. On April 8, found improvement had continued, when the same treatment was used for three minutes, after which she declared herself completely relieved of the tinnitus and stuffed sensation, with hearing power fully restored. Saw her again on April 13, when she declared the good results from last treatment to have still continued.

I find that in the majority of cases, when the strings of the instrument are used, that it is only necessary to strike them lightly with the friction wheel. In vibrating the heavy string, I generally set the bridge back behind the central attachment, and adjust the motor in such a way that the belt is at a considerable tension, so that the pulley wheel revolves slowly; I also generally use this adjustment when setting in motion two strings at one time. The principle of this method of treatment embraces two essential features, which to my mind make this method of massage the only scientific one applicable to the membrana tympani and its associate sound conducting parts. Massage is the application of motion to disease, and its scientific administration consists of its application in a systematic

manner. In applying massage in aural diseases it is necessary to produce a to-and-fro movement of the membrana tympani, and if possible by a force which is harmless and at the same time effective. The vibrometer fulfills these conditions. Any of the strings on the instrument that may be set in motion by the friction wheel will produce a certain number of vibratory movements to the second of time, and the movements of the central attachment are also measured. What could be more systematic than this? The motions of the membrana tympani were intended by nature to be vibratory, and as the vibrometer generates measured motion and these motions are vibratory, theoretically we have a scientific and effective method of massage in aural diseases, and, as demonstrated practically by the use of the vibrometer, we have in fact a great scientific advance over all previous methods. Since the introduction of this treatment in aural diseases it makes possible more or less benefit in cases of deafness heretofore considered hopeless, and has opened up the field for the treatment of aural diseases to such an extent that the number of deaf patients seeking relief at the aurist's hands will at least double itself.

DISCUSSION OF DR. HENRY F. GAREY'S PAPER
ON "USE OF THE VIBROMETER IN THE
TREATMENT OF DEAFNESS."*

BY WILLIAM R. KING, M. D., WASHINGTON, D. C.

In discussing Dr. Garey's paper, I shall begin by saying that his methods have been closely followed by me since the beginning of his experiments, owing to the fact that I have been greatly interested in the treatment of deafness and tinnitus by means of sound waves, or by aural massage, since 1887, and have experimented and treated many cases by this method since then, though with crude and unsatisfactory instruments. Since using the vibrometer, which after much study and experimentation is now presented to the profession in practical shape, I have undoubtedly increased my percentage of good results.

I don't believe I am over sanguine or carried away by my interest in this method, and believe I can rightly appreciate that this does not offer us a panacea or cure-all for auditory ailments; and hope I may always be ready to see the failures and to strive to find methods or remedies to reach some of them.

In speaking of the *application* of the instrument I wish to call attention to the central attachment or post for coarse vibrations. Dr. Garey has not given it as much attention in his paper as it deserves; it is very useful as a general means of aural massage, rougher in nature and more general in application than the strings which help to make up the

* Read before World's Homeopathic Medical Congress, Chicago, May 31, 1893.

instrument. I often use it before applying the "similar sound" to a given case, as a species of gymnastics, to stimulate secretion and motion in the conducting apparatus of the ear, viz., membrana tympani and ossicles. In most cases, in fact in all where tinnitus is present, I follow this up immediately by the nearest approach to the similar pitch obtainable.

I agree thoroughly with Dr. Garey that the best results are achieved in cases accompanying hypertrophic catarrh, and that the least benefit is apparent in cases of atrophic nature.

Regarding the method of treatment in the absence of tinnitus, my experience does not entirely coincide with that of the author of the paper. I do not feel that as yet we have any safe rule to guide us. My method has been to try the numerous sounds and variations thereof until I find the one that seems to give the best immediate results, or that the patient will himself speak of as very penetrating and powerful, though not necessarily loud or heavy.

It seems almost impossible, at present, to simulate all the qualities of tone as they occur in the ears of those suffering with tinnitus; in fact it would appear to be unnecessary; however, it seems advantageous and quite necessary to secure the closest simulation of pitch, thus in many cases soon obliterating annoying tinnitus and improving hearing power.

The arrangement permitting of the picking of two strings simultaneously adds decidedly to the usefulness of the instrument, as it increases the range of pitch as well as varying the quality of tones procurable, thereby decidedly enlarging our field of application.

The force used for creating the massage, or gymnastics of the membrana tympani and the ossicles, viz., vibrating force or sound carefully and scientifically applied, is nature's remedy, because it is adapted by nature and is the only force which can rightly or safely be applied to these delicate portions of this complex organ of hearing.

A startling commentary on this subject is the array of

cases *benefited* who have been relegated to the shelf by ancient and modern otology. Cases declared unhelpable have been vastly improved—pray make no mistake, I did not say *all* cases.

It may be interesting to hear the latest regarding the instrument which was first invented for the application of this method of aural massage. Mr. E. J. Godman, the inventor and patenter, is constantly on the lookout and always striving for improvements to his machine. He has made many that you all know of; permit me to report a few so recent they have not yet left the factory.

First. The machine has been taken from its case, and is now mounted in a solid stand or table of oak, being set below the level, or so that the face of the instrument is just level with the face of the table. This is all supported by rigid, solid metal legs which absolutely prevent foreign vibrations.

Second. The motor has been removed from its little shelf and relegated below the table—it can be placed upon a box on the floor, a shelf against the wall, or better yet a shelf solidly attached to the metal supports of the table; a belt goes up through an aperture to a wheel on a shaft, the other extremity of which carries a wheel with a rubber tire (a friction wheel) which, in its revolution being in contact with a larger flat surfaced wheel on the main shaft of the instrument, turns this in harmony with itself. This arrangement does away with the necessity of shifting the motor each time you wish to shift the carriage from one string to another, a consummation to be devoutly thankful for. The removal of the motor from the instrument, as at present attached, will recommend itself to all who have used the vibrometer—a great amount of undesirable jar being thus avoided.

Third. Ratchet keys capable of very fine adjustment of tension of strings are now provided for the instrument.

Fourth. A rheostat or resistance coil is now to be placed beneath the table, between the storage battery and the switch, by this means enabling us to control the speed

and number of revolutions to a nicety. Other, though comparatively minor, improvements are being made, and others are contemplated, as for instance the substitution of a roughly corrugated rubber band for the picker on the wheel, thereby getting rid of the metallic sound of pickers on the wire strings.

I have experimented with a number of appliances for the production of the sounds and pitches that I have required, but I always fall back on the vibrometer, especially as at present constructed, for satisfactory work and results.

This instrument may be, and probably is, as yet but in its infancy; it and the method it applies can only be perfected by constant work and experimentation both on the part of the profession and of the manufacturers; each improvement we can suggest, if it only should serve as a means of helping one solitary case, would be well worth our while.

The experiments being made by different methods for treating deafness by sound waves are indicative of the interest the profession has taken in this matter; they are indicative of a lack of something in our usual armamentarium, which is greatly longed for by patient and doctor; that is the means for making the deaf *hear*, and for relieving distressing tinnitus. There has been a dearth in this direction, and perhaps there is still; but I believe fully that we have in aural massage (vibratory force) a decided acquisition at our hands.

NEW SUGGESTIONS ON THE TREATMENT OF CONSTRICTION OF THE ESOPHAGUS.*

BY D. G. WOODVINE, M. D., BOSTON, MASS.

I propose to speak of three forms of constriction of the esophagus, viz., spasmodic constriction, organic constriction, and constriction from malignant disease of the passage.

The first variety belongs to the nervous, and is found most frequently among debilitated women, whose nervous systems have been wrecked to a greater or less extent by the habits and customs of the present generation, or by having inherited a constitution without any vital stamina. The general appearance of these patients is pale, anæmic, nervous, having a poor appetite for proper food, or a capricious one for unnatural articles. This form of stricture is not wholly confined to women, but sometimes occurs among men. When it does occur among females it is more likely to be near the menopause. The constriction commences with a very slight difficulty in swallowing solids, accompanied with a sensation that something has lodged in the gullet, and necessitates the use of some kind of liquid to remove it. The difficulty develops more or less rapidly until there is a sense of dread at the thought of swallowing anything of a solid character. We have known persons afflicted with this complaint to spend nearly two hours in eating a meal. The result in such cases could be nothing less than extreme emaciation, or in other words slow starvation. Under such circumstances the patient realizes that there is a necessity of getting relief in some way or other, and most naturally applies to her family physician to obtain relief. When, however, she

* Read before the Homeopathic Congress, Chicago, June, 1893.

is informed what is necessary to have done, in order to overcome the difficulty, she naturally shrinks from the operation of dilatation. The patient concludes to postpone the operation, hoping that the difficulty, if nervous, may after a while pass away. The expectation of the patient is, however, hardly ever realized in this regard; for she is obliged sooner or later, to submit to an operation. When this is successfully done she feels that she has a new lease of life, until there are signs of its reappearance, which is most likely to occur. This state of affairs fills the mind of the patient with fear of choking and a dread of another operation. However, being familiar with the relief received by the dilatation, she does not shrink from the second as she did from the first, but has it repeated; this is, however, not so in all cases, for there are those that put it off until starvation stares them in the face, before they will submit.

The cause of this form of constriction we believe to be a deficiency in the nerve supply to the muscle of the esophagus at a particular point, which suggests some diseased condition of the base of the brain; the extent of this diseased condition determining whether it be a spasmodic or a permanent constriction.

The extent of time covering a spasmodic constriction, according to recent authorities, may be from a few moments to several hundred days.

The treatment of spasmodic stricture of the esophagus requires the use of the cone or olive shaped bougie. It is well always to begin the dilatation with the smallest size, and not to hurry the operation when there is decided resistance. We are well satisfied from experience that the presence of the bougie will sometimes occasion a decided spasm of either the constricted parts or those in close proximity, and may continue for an indefinite period, the evidence of this possibility being in the fact that while the bougie may pass down comparatively easy, when the attempt to withdraw it is made, it can only be accomplished with great difficulty. In such cases patience is of the greatest importance in making a success of passing the bougie. It

should be covered with some oleaginous substance like cosmoline or sweet oil. It is important that the operator shall have acquired such a sense of touch in the use of the probe that he may be able to recognize the condition of the parts so as to readily determine the difference between the constriction and a pocket of mucous membrane. When the point of constriction is reached by the bougie, and the resistance is decided, the pressure should be gentle at first, and increasingly firm but not harsh, accompanied by a rotary movement of the bougie in the hands of the operator. If the parts do not yield to a proper amount of pressure, the instrument should be removed and the patient allowed to rest; I then, after thoroughly anointing the bougie, it may be again introduced and the pressure applied as before. This operation may be repeated several times, or until the stricture is overcome, provided the condition of the patient will allow. This class of strictures is not as difficult to overcome by means of bougies as those where the muscular tissues have become more permanently thickened, called organic.

The following remedies, used internally, we have found useful in treatment of spasmodic stricture of the esophagus:

Belladonna is indicated by pressing pain, like contraction and a feeling as though a foreign body had lodged fast in the esophagus; a feeling during deglutition that the throat is too narrow or drawn together too tightly for food to pass properly.

Gelsemium semp. has afforded relief in some cases of spasmodic constriction, where there seems to be great prostration of the nervous and muscular systems.

Hyoscyamus nig. is called for in that class of cases where the patient has a great deal of twitching of the muscles; spasmodic constriction of the esophagus from a variety of causes; solid and warm food can be swallowed best; liquids cause spasms in the esophagus, stop respiration and talking.

Hydrophobinum is spoken of by some authorities as being indicated in periodical spasm of the esophagus with painful urging to swallow, but impossibility of doing it; abhorrence of fluids, especially of water.

Phosphorus, stricture of the esophagus, regurgitation of all food ; food reaches the cardia and is immediately ejected.

Veratrum alb. is useful in spasmodic constriction of the esophagus, resulting in paralysis of the tube.

The organic form of stricture is the more difficult to treat by means of the bougie or by internal medication. The deposit of fibrinous material into the submucous and muscular tissues, followed by thickening and contraction of the muscular tissue, gives rise to a condition of muscular resistance which sometimes is most difficult successfully to overcome. This, the result of various causes which are not always understood, stares one in the face with a sort of defiance which is certainly very discouraging. It is a fact, however, that we have strictures occurring from mechanical causes, such as drinking hot water and corrosive substances. The treatment of what is denominated organic stricture of the esophagus may be divided into general and local, or systemic and local. We find the general system much depressed from want of food. The patient has become much emaciated, very much discouraged, and hardly cares to make any further effort to live ; in fact a release many times would be welcomed. The importance of getting nutrition into the system, in such a manner as to give the patient strength as soon as possible, cannot be over-estimated. If the patient is much reduced physically, injections of beef tea by the rectum should be given until she is sufficiently strong to bear the operation of dilatation with the hard rubber or ivory bougie. This operation, as before suggested in the treatment of spasmodic stricture, should be practiced in this case with even more care, if possible, than the other. We have found that it requires much patience and care to work the bougie through this form of stricture ; but when it is accomplished there should be two or three larger sizes passed through at one sitting. In some cases of bads tricture there will be more or less hemorrhage from slight laceration of the tissues. When this is the case, the dilatation should not be pushed too far

at one sitting. If any hemorrhage occurs, a hamamelis suppository of appropriate size should be carried down into the partially dilated stricture and left there, which will soon melt and operate on the lacerated part as a local styptic. If the lacerated tissue does not give rise to hemorrhage, there should be a calendula suppository applied, which will have a most beneficial effect. There can be no doubt that this new method of applying remedial agents directly to the diseased part, where dilatation is necessary, may prove of great value in the treatment of constriction of the esophagus. After one, two, or three days, as the case may require, the operation of dilatation may be repeated, beginning again with the smallest size bougie and increasing the number and size until finally the passage is fully dilated, following each time of dilatation with the local application of medicine by means of the medicated suppositories as the case may require. In fact any remedy which the operator may desire may be applied locally in the form of a suppository.

The internal administration of remedial agents may be practiced as they may be indicated by the totality of the symptoms.

The malignant form of constriction is of the most serious character, and the one in which we have less hope of doing anything to permanently relieve the patient. The treatment must necessarily be palliative. The dilatation must be cautiously carried on to a greater or less extent, depending upon the progress that the disease has made upon the passage. In the primary stage of the development of cancer of the esophagus it will be difficult to recognize the difference between it and organic stricture by the touch or by the amount of pressure of the bougie necessary to open the passage. In such a case we depend upon the character of the touch, and the general appearance of the patient, to decide. In such cases our success will depend much upon the judicious use of the bougie and the proper treatment immediately following, whether or not we give relief to the patient, prolong his existence, or by injury or perforation

hasten a fatal termination. We suggest that immediately after the dilatation has been accomplished a suppository of *hydrastis canadensis* should be carried into the dilated stricture, and left to melt and flow down over the diseased part. Any other remedy that the physician may desire can be applied in the same manner. We believe that these local applications, following so soon the use of the bougie, will be likely to have a healing effect and thus prevent as rapid a degeneration of the tissues as would otherwise occur. It will also leave the passage in a better condition for a subsequent dilatation. If the disease has progressed so far that the tissues have begun to soften and break down, the appropriateness of the local treatment will only appear the more reasonable.

As we have before stated, we do not undertake the treatment of these cases with any hope of permanent relief, but with the hope of making the patient more comfortable. The following remedies may aid us in thus doing.

Arsenicum album, more than almost any other remedy, will be called for by the totality of the symptoms during the progress of the disease. The characteristic symptoms which call for its use are excessive pains in the cardiac region of the stomach, extending up into the esophagus, of a burning character causing nausea; great thirst for cold water and acidulated drinks, a small quantity of which satisfies; vomiting of food soon after eating.

Hydrastis canadensis is indicated when there is a sense of great prostration and sinking at the epigastric region, with palpitation of the heart. Empty, gone feeling in the stomach. Acute distressing pain in the region of the pit of the stomach.

Kreosotum for nausea and vomiting, with a painful sensation of tightness at the pit of the stomach. Painful, hard place in the region of the stomach.

Lycopodium, painful pressure in the pit of the stomach and lower part of the chest. Contraction and spasm of the stomach when breathing.

Phosphorus, the region of the stomach is painful to the

touch. Painfulness of the stomach when walking. Violent pain in the stomach. Burning of the stomach, extending up into the throat.

A word in regard to the feeding of patients comes within the scope of this paper. We do not propose to refer to old methods of feeding, but to suggest a new one. Neither does the author propose to ignore any other method. We suggest that good tender beef or mutton be finely minced and slightly moistened and salted and frozen in appropriate molds, with hollow centers of proper size and form, and carried down by the same instrument that carries the suppository, through the dilated stricture to the stomach, and there be dropped and the introducer removed. By this means something more than a liquid diet could be given until the patient will be able to swallow solid food himself. It might be well, after the dilatation is made, to carry a few beef balls into the stomach before carrying down the medicated suppository to remain in the constricted portion. Of course this same method of introducing solid food into the stomach in other forms of stricture, when necessary, is equally as feasible.

The instrument above referred to, called the introducer, is a very simple invention of the author. It consists of a slightly tapering left-hand screw, with a hollow shank with a thread cut in it to correspond to the screw thread on the whalebone rod upon which the bougies are introduced for the purpose of dilatation. When the dilatation is accomplished the bougie is removed from the whalebone rod, and the introducer screwed on in its place.

The size of the introducer is as follows: whole length one inch and a half; length of shank half an inch, breadth of same one quarter of an inch; length of coarse lefthanded screw one inch, and size of same one-eighth of an inch and slightly tapering. It is made of metal, and silver plated.

The suppository is another invention of the author, and is designed to go with the introducer. It is nothing more or less than a rectal suppository made with a hollow center of appropriate size to receive the screw, which is screwed

into each one before the suppository is cold and before it is removed from the mold. These are kept in a cold place until needed for use.

When medicated ice could be in any way serviceable in the treatment of disease of the esophagus, medicated water might be put into the suppository molds and frozen with the hollow center for the introducer, and thus be passed down and up the gullet as many times as necessary, or be lodged at any point in the cardiac region of the stomach.

The operation of introduction is quite simple. The suppository is screwed on to the introducer, and the introducer is screwed on to the whalebone rod and carried down the esophagus to the dilated portion near the cardiac orifice of the stomach, when the whalebone rod is turned several turns to the right, when the suppository will be detached and the introducer must be removed. If the stricture be located at the upper portion of the esophagus, then the suppository should be carried down and up several times when a sufficient amount of the remedy will have been applied to the dilated portion.

It is self-evident that a suppository could not be lodged very well, at the upper portion of the esophagus without great inconvenience to the patient.

The writer has used these suppositories, by means of the introducer herein described, to a limited extent successfully; but the cases to which they are applicable occur so seldom in one's practice that it may take some time before the results can be definitely known. We therefore thought it best to publish the facts and thus give to the profession an opportunity to test, criticise, or improve on the suggestions for the benefit of humanity.

BOOK REVIEWS.

DISEASES OF THE NOSE AND THROAT. A Text-book for Students and Practitioners. By HORACE F. IVINS, M. D., Lecturer on Laryngology and Otology in the Hahnemann Medical College of Philadelphia; Laryngological Editor of THE JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY, AND LARYNGOLOGY, etc., etc. With 129 illustrations, including 18 colored figures. Pp. 507. Philadelphia and London: F. A. Davis Co., 1893.

The author of a text-book on practice sets for himself the task of answering satisfactorily at least two questions with respect to each of the diseases of which he writes. These are: first, how may the diseased condition be recognized and identified in the living subject? and, second, when and how shall methods of treatment be applied? The recognition of local departures from normal depends so largely upon accurate knowledge of the anatomy of the parts, that the anatomical process is, of necessity, an important section in works dealing with anatomical specialties in practice such as the above.

Dr. Ivins divides his text-book into three parts, which deal respectively with the nose, the pharynx, and the larynx, each together with its diseases. The first chapters of each part are devoted to the consideration of anatomy and physiology, and are especially valuable by reason of the excellence of the illustrations, which are reproduced from photographs of sections and dissections made by Dr. R. B. Weaver of the Hahnemann College of Philadelphia. The accuracy of the descriptions is greatly enhanced by these illustrations—and, in fact, clear as the descriptions are, they would fail of their purpose if unaided by the pictures, or by actual demonstration. The chapters on rhinoscopy,

pharyngoscopy, and laryngoscopy which follow, each in its place, are all good, and especially the last, which is well illustrated. The results of anterior rhinoscopy would have been made clearer had the instruments illustrated been represented *in situ*, showing in perspective the anterior view of the nasal fossæ. The methods of examining the antra of Highmore by use of peroxide of hydrogen and by transillumination are clearly described. The special value of the work, aside from the illustrations, lies in its therapeutic indications. Of these the author says, "Where possible, I have tested the various symptoms recorded, and, finding most of them reliable, have allowed them to stand upon their own merits. Those remedies which have disappointed, where I have been taught to expect much, have been divided into two classes: first, those which have failed in a few instances, but have not been expunged, as failure may have been due to the fact that the remedy was not applied carefully enough; second, those which although long recommended, I have never found to act well, even after many trials; the latter have been mentioned with the natural comment." The author has confined mention, as far as possible, to those remedies which he has found reliable; and these indications, confirmed by his own experience, give to his work a value far beyond that of any compilation.

Space will not permit even mention of the many valuable therapeutic hints. Many new applications of remedies are mentioned, and command attention because of the author's known reliability. For instance, experience leads him to place apis and ignatia "far in the lead" among remedies for follicular tonsillitis, thus relegating to third place the favorite mercurius biniodide. The student will be disappointed in his search for directions for some operations, as those of intubation and tracheotomy; but, taken all in all, the value of the original matter in the book far outweighs its demerits. The publishers have done their work well, and have contributed to make Dr. Ivins' book one of which homeopathists may be proud.—M. L.

We have on hand for review a second edition of Berry's "Diseases of the Eye," the fourth edition of Seiler and vol. 1 of a new system of "Diseases of the Ear, Nose, and Throat," edited by Chas. H. Burnett, M. D., and published by the J. B. Lippin-

cott Co. All are able works, the last especially promises to be probably the most complete and valuable publication on the subject in the language. The pressure on our columns for this issue prevents extended notice at this time, but they will be properly reviewed in the October number.—ED.

THE JOURNAL OF OPHTHALMOLOGY, OTOLOGY AND LARYNGOLOGY.

EDITOR,
CHARLES DEADY, M. D.

ASSOCIATE EDITORS,
H. H. CRIPPEN, M. D.
H. F. IVINS, M. D.

A STUDY IN LIGHT AND REFRACTION.

BY W. U. REYNOLDS, M. D., NEW YORK.

In a previous article it was endeavored to be shown that a unit of refraction could be based upon different distances. The present writing is an endeavor to show that the distances correspond to rays of light of different sizes, and that the diameter of the ray is also proportional to the focal length of the refracting medium, and consequently there is a certain sized ray for each eye when in its condition of rest, which will correspond with its "far point."

We will first understand that light extends itself in perfectly straight lines except when it passes through media of different densities, retaining the last direction until it is again changed in its course. Next that all parts of a radiant or illuminated surface give off light in all directions, and that the surface or radiant must be of definite size. Consequently it has limits, and the light from the direction of points at these limits must cross that from points within the limits, and the light from each other, the lines of direction marking certain parts of the light. So that an object being illuminated by or intercepting the light from the radiant or illuminated object would, when at different distances from it, receive more or less of the diagonal light according to the distance and the size of the intercepting surface, calling all those rays or directions diagonal which did not extend directly from points on the radiant to cor-

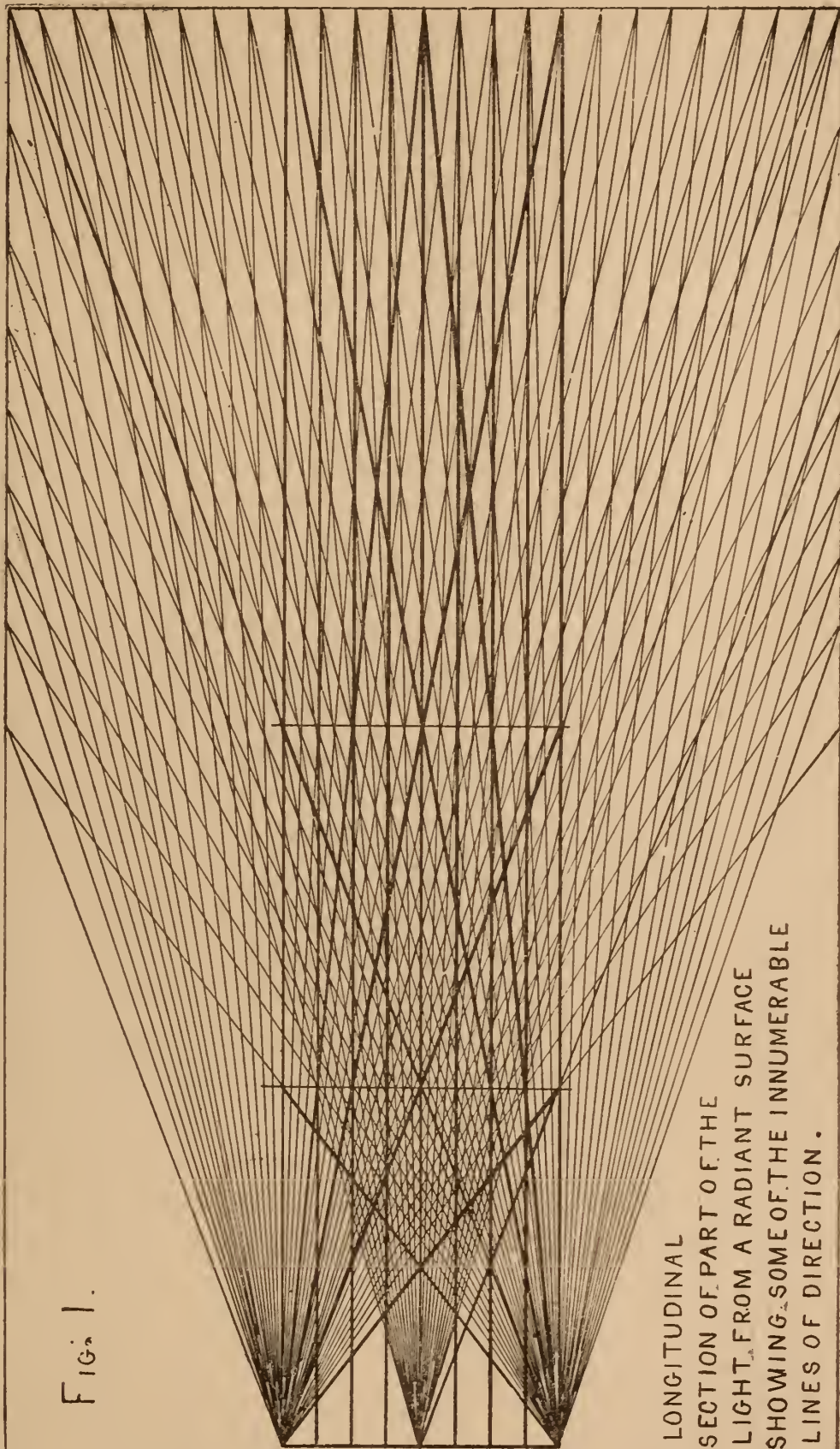
responding points on the intercepting surface, area for area. That is, all those are diagonal which are not parallel to each other. The parallel part of the light consequently will be a beam equal in cross sectional area to the area of the smallest of our elements, be it the radiant or the intercepting surface. In other words only those rays or parts of a ray will be parallel which emerge straight out from the radiant or illuminated surface. The diagonal limits will evidently be in the form of triangles having a base corresponding to the area of the intercepting surface and an apex in a point on the radiant. The base of each triangle is thus attenuated light, but the attenuation is re-enforced by other light from other points, and the brilliancy will be in proportion to the square of the distance inversely, multiplied by the area of the radiant surface.

It is evident that the further removed is the radiant, the more attenuated must this diagonal light become, while the parallel part remains the same. It is also evident that with our innumerable solid triangles and prisms or cylinders, any longitudinal segment will have the same structure as the whole mass, whether it be short or long, broad or narrow. Also that in the whole mass or any segment, the internal limits or sides of the triangles having their apices on the external boundaries of the radiant will intersect each other midway between the extremities of the ray. The ray thus has a center with certain characteristics and is a regular geometrical solid figure, which may be of microscopic smallness or as broad as the sun itself, could there be an intercepting surface of the dimensions of the sun's outlines.

A reference to the diagram gives an idea of the arrangement.

Now the angles formed by the crossing in the center, of the limiting elements of the triangle are double the size of those at the surface, because they are measured by the arc of a circle of half the radius, and because they are angles at the center of a circle, those at the radiant being at the circumference, considering our two surfaces to be chords or double sines.

FIG. 1.



LONGITUDINAL
SECTION OF PART OF THE
LIGHT FROM A RADIANT SURFACE
SHOWING SOME OF THE INNUMERABLE
LINES OF DIRECTION.

Now taking the obliquity of the parallels with each other as unity and the obliquity of the diagonals from the same point in the radiant with each other as two, the obliquity of the lines from the center point where they receive a new relation with each other, being changed to opposite sides of the central line or axis will be four, being twice as great as at the end. A small point of light at this center will have the same lines of direction as an area at double the distance with twice the obliquity of points on that area and four times the obliquity of parallels.

The greater the disproportion in size between the two surfaces, the nearer to the smaller one will this point of intersection of extreme elements be situated.

We have now at the receiving surface, supposing it equal in area to the emergent surface, two sets of directions of light; one direct by the parallel rays and erect, and one reversed by the parallax, coming with an obliquity of four, apparently from a point half as far away.

The parts of each ray are clustered round a central line, the axis. Every ray of light, therefore, be it large or small, short or long, has a similar arrangement, entirely due to geometrical construction or parallax.

In a lens we have a transparent medium or mirrors with two curved spherical surfaces, very much like an arrangement of an innumerable number of triangular prisms placed base to base about a center. Their action would be more prismatic were the surfaces conical instead of spherical. We would then have only one effect produced, that is, the changing of direction of the parts of a ray toward the center line without an alteration of its density except in one direction, that at right angles to a diameter, not in the direction of a diameter, which would give a distorted image. Also there would be only one point, the apex, with the perpendicular to which the axis of a ray could coincide and receive the influence of the surrounding medium equally upon its parts.

Not so with a spherical surface. A curved line upon this surface equally distant from any fixed point will be the cir-

cumference of a circle. The circle may be large or small, and the point in any location on the surface. Also, if a line pass through the center of this circle and the center of the sphere of which the surface is a part, extending into space, any one point of the line will be equally distant from every point in the circular line, and the straight line will consequently be perpendicular to the spherical surface. That is, it would be an axis. These axes are countless, diverging from both surfaces from the center of curvation of each.

We know that light is deflected as an entity with certain changes in its internal parts, on entering a medium of different density, the deflection bearing a certain relation to a perpendicular to the surface at the point of entrance of each part and of the center of the light as a whole.

We know that polished surfaces will reflect light, and that the angle of reflection is equal to the angle of incidence, and that when the angle of incidence exceeds a certain size the light disappears; also that at certain angles the ray of light incident upon a transparent surface will appear to go through, and that when the angle of incidence is such that the angle of reflection is at a right angle to the angle of refraction, the disappearance of the light occurs. This, the angle of polarization, varies for different substances according to their density or refracting power.

The surface of water will act as a reflector, especially to light striking from beneath. In prisms of polished glass we see this total reflection, no light coming through except within certain angular limits.

The phenomena of reflection and refraction depend upon the perpendiculars at the surface for one controlling agency.

In the formation of images in reflecting surfaces, the perpendiculars come into operation again, controlling the size and direction of the image. Thus in curved reflectors the image will be small or large, according to the positions of the eye, object, and the perpendiculars involved.

In the lens we have two curved surfaces which can form

an image—a concave and a convex. The images on these surfaces will vary in size with the position of the object. At a certain distance they are equal, and they maintain a certain relation to each other. The posterior picture is inverted and can be well seen when a mirror is held behind a lens. The eye at the focal point, when even a small flame is in focus, will see the whole area of the lens in a blaze of light.

With the ground-glass screen at the proper place a small dot or line will appear perfectly formed, but if the screen be moved, two images appear upon it; on moving back the screen, they move toward each other and unite. They move one way when the screen is moved up and the other when it is moved back, appearing to cross at the focal point.

The lens forms an image on the screen when all but the smallest part is covered, and this part may be any portion of its surface.

When a disk with two openings is placed before the lens, two images are formed which will unite at a focus nearer the lens than when a single part nearer the center is uncovered. A pin-hole in a disk will allow a picture to come through and show on the screen. A pin-hole alone, without a lens, will cast an inverted image upon the screen. With a small pupil the screen can be moved back and forth for considerable distances without blurring the picture.

A diaphragm with a small opening, placed between lens and screen, will allow a picture many times larger than the opening to be formed, the proportion existing between the size of the picture, the size of the opening, and the distance of the opening from lens and picture showing the point on axis where the peripheral lines cross, and as this point is at a certain distance from the lens, and as the picture is inverted, the rays must have started at the lens periphery as well as center, in an upright condition, and been reversed at the point on the axis spoken of.

So that we get upright rays crossing behind the lens and giving an inverted picture, and rays already inverted in

front forming an inverted picture without further change ; the union of the two giving a clear bright image at the proper focal distance.

When the screen is moved toward the lens from its focus, a patch of blurring appears in center of picture, evidently light, even while the dark lines of the picture are visible in and around it ; yet there is only an illuminated surface of white paper in the field. The circular patch of light (there is no pupil in front of lens) gets smaller as the screen is moved nearer the focal point, and a movement still further, after the patch of light seems gone, brings out the lines of the picture clearly. A movement still further away from the lens brings back the patch of light.

Thus any part of the lens forms a picture : picture-forming rays cross behind as well as come already reversed, two pictures are formed, a small opening will reduce the size of a picture, the center of optical effect being brought closer to the anterior surface at the same time, and the picture comes out after the cone of light disappears. The whole lens is a blaze of light when the eye is at the focal point, so that, if any picture were on the posterior surface, it would have a brilliant setting.

“A clear picture is not formed unless the object is at twice the distance of the principal focus. The image and object will then be the same size. As the object is brought closer, the image increases rapidly in size and entirely disappears, having become infinitely great, when the object is at the principal focus. As the object is removed, the image becomes smaller and smaller and the focus is nearer and nearer to the principal focus, but never goes beyond it toward the lens” (Lardner).

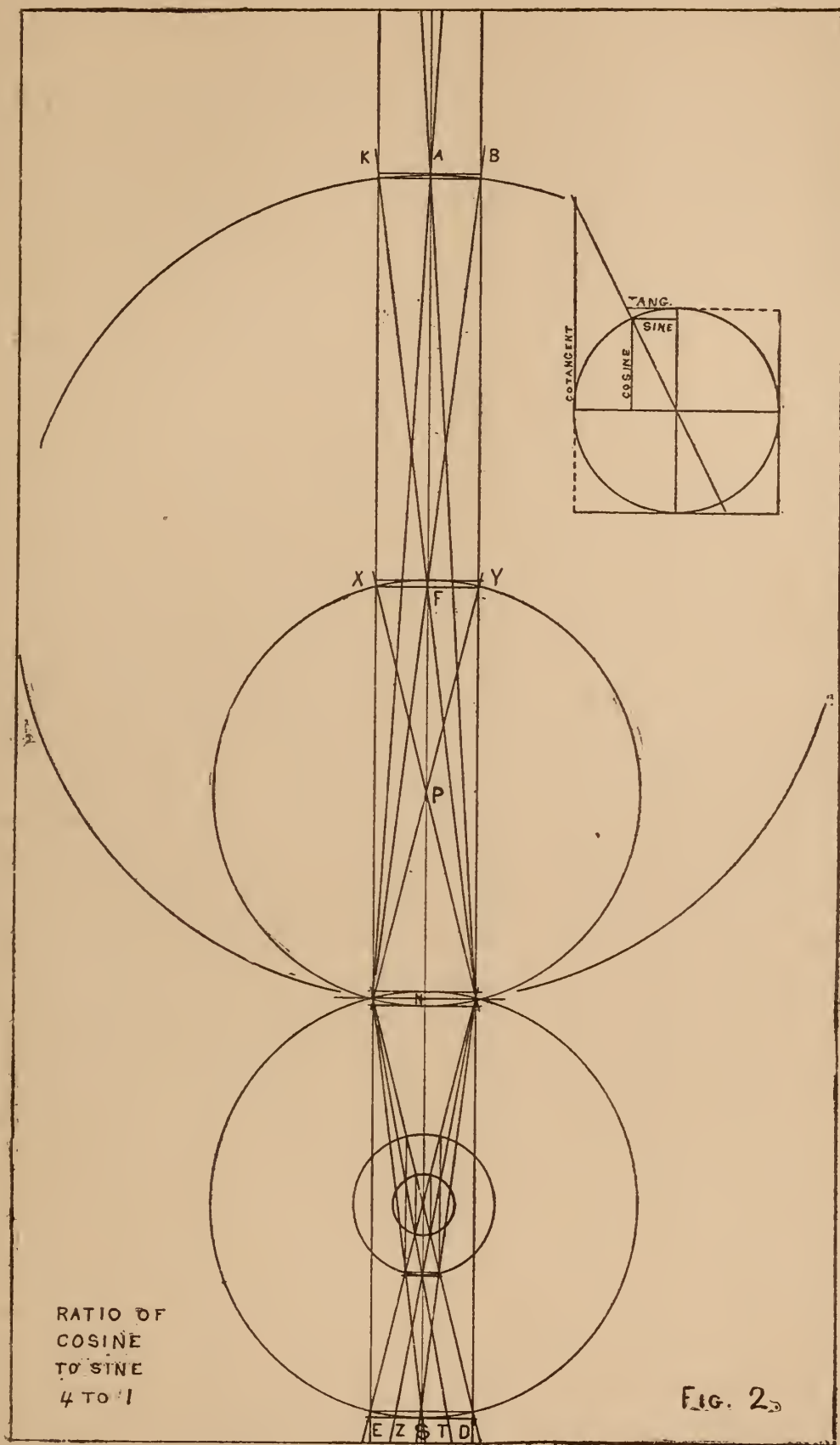
The picture gets smaller, the further off the object, but not in proportion to the distance exactly, if the position of screen is changed, as can be determined by measuring distances and pictures.

If we allow that our rays of light pass through, we must allow that their manifestation as light is extinguished at a certain point. If we allow that the extinguishment is due

to the phenomenon of interference by the meeting behind of the different parts of the same or each ray, that is, the part entering diagonally meeting the part which entered straight and suffered refraction just as much as the diagonal did and coming from the same part of the object, though entering upon correspondingly opposite parts of the lens; if we allow that a ray has parts; if we allow that directions can be parallel even at infinite distances; if we allow that correspondingly opposite parts of the lens will have an equal but correspondingly opposite influence; if we allow the amount of light coming from a object is limited as to the area of its ray entering the lens by the area of the lenticular surface exposed, then the diagram hereto annexed shows in geometrical form the action of the lens, enabling us in a simple way to calculate the length of focus for any distance, with the size of the retinal picture, showing the relation of the nodal point or point of intersection of the axes connecting each point of the picture with its corresponding point in the object; all depending upon the relations between the parts of two circles and a certain line, the diameter of a ray of light.

From all parts of the field come rays entering upon parallel lines with a central or principal ray entering upon the principal or central axis; the focal point coming nearer the lens as the source of rays recedes and the reverse; the focal length controlled by the distance and refractive power.

The controlling line is the diameter of the ray and is a chord of the circle anterior to the lens. A circle posterior to the lens has a similar chord, controlling the arc of the picture and bearing the same proportion to similar parallels. Thus there are two circles with parallels, (the double cosines) two lines, chords (the double sines), one of the field circle and one of the retinal circle. In circles the sines have the same relation to the cosines as the tangents have to the radius. As the radius of the field circle is increased the radius of the retinal circle diminishes, but its center remains unchanged, and also the rate of change is not in a simple



proportion, but according to the proportion existing between the other parts.

The point of meeting of the refracted diagonal and parallel changes with every movement of the object, that is, with every change of the angle of which the diameter of the ray is the chord. If now the size of the ray could be made to change with the change in size of the field circle, the retinal circle would remain of same size, the distance of retina would remain the same, the size of the image would correspond to the distance of object, and the center of refractive power would be moved slightly.

With an ordinary lens the screen must be moved with every change of distance of object. With the eye the screen is stationary and the power changed. Thus the retina being adapted to rays of a definite size which must come from a certain distance ; if that distance is decreased, the refractive power is increased by a shortening of the radius of curve, and consequently the size of the ray and distance to which the eye is adapted is decreased, the parallels are brought closer and the focus kept at the retina.

The double tangent representing the distance between the extreme points on the cornea need not change, as a shortening of the radius causes a shortening of the sine and cosine. Thus for the same tangent we may, by changing the radius, have the sine and cosine in any proportion to each other. The size of ray is thus not dependent upon the extent of the anterior lenticular surface exposed, but upon the power of refraction of the whole medium. A lower power with longer focus has a longer ray of greater diameter ; a higher power, a shorter, narrower ray.

The parts of the ray we are to consider are the parallel outer parts and the diagonal central parts. They are represented on a plane surface as though the whole solid were cut in two longitudinally in the center. We have thus the two parallel outer boundaries running to the extremities of the common chord of the two circles, the diameter of one being the diagonal double distance of the anterior principal focus, and the diameter of the other being the same

length. The condition in which the diagonal part issues from the lens parallel to the principal axis, and the image is the same size as the object, and in which the light from a radiant point at the anterior principal focus would issue from the lens and form a disk of the size of the ray at double the distance of the principal focus.

The two circles overlap, and a line connecting the points of intersection is the diameter of the ray, a chord common to both circles as they now stand.

The diagonal incident and refracted lines are the diameters of the circles. The parallels change to diagonals on opposite sides of the dividing line. The parallels are the chords of the supplements of the arc which measures the diameter of the ray. Extend the parallels indefinitely in front. The parallels meet the diagonals at double the distance of the principal focus. These parallels cannot change, though the object be removed indefinitely. The direction of the diagonals will, however, change with every movement of the object, coming from a different point, the center of the new distance, or the periphery of the end of the ray, each time.

It is the change of direction of these diagonals which causes the change in the focus, considering all light entering at the same point to receive the same amount of reflection. According to Sir David Brewster the index of refraction is the same for all angles of incidence.

These diagonals can never coincide geometrically with the parallels. The projections of the parallels cross at the middle point behind, just as the anterior diagonals cross in front, marking a point near the picture which is the center of the posterior circle.

The line extended through the centers of these circles will pass through the center of the ray and be the central or principal axis. Each ray has an axis which will pass through the same point on central axis, the center of diameter of the ray, indicating the nodal point or optical center.

All corresponding points in the object and picture can be

connected by an axis which will pass through this nodal point.

We have seen that in the circle the proportion existing between certain parts changes with a change in the radius. So the radius of the posterior circle changes with the anterior circle, not, however, in a simple proportion, and the parts become smaller and smaller as the object is removed; the intersection of the refracted parallels and diagonals approaching nearer and nearer the central line and fixed center, running along the unchanging diagonals of the posterior circle. In the front circle the diagonals are the moving lines. In the near circle the original parallels are the moving lines.

It will be noticed the movement of the lines forms a conical outline with the picture at the apex.

If we compare the amount of movement at the extremity of the moved posterior line with the amount it has undergone at the location of the new focus, after removing the object to double its first distance, we will find they are in the proportion of 3 to 2.

And each double sine of the posterior or retinal circle is to the original as the original cosine ($\frac{1}{2}$ the parallel) is to its multiples less one, in the field circle. Thus equal distance = double cosine = 2, deducting $1 = 1 = \frac{1}{1}$ of the primary double sine. Double the distance = 4 times the cosine = $4 - 1 = \frac{3}{1}$ of primary double sine. Quadruple distance = 8 times cosine = $8 - 1 = \frac{7}{1}$ of primary double sine for new one. Length of focus equals length of principal focus plus the above fraction of principal focus.

The principal ray only is shown; other rays join side by side with this, their light overlapping and their axes intersecting at the nodal point.

A disk $\frac{5}{4}$ inch in diameter, the same as that of a test case lens, is cut from black paper and pasted on a sheet of white paper. This is illuminated by a gas jet, the jet screened so as not to be visible.

A plus lens marked 5 inches is made to focus this object

at different distances corresponding to the arrangement of the diagram, with the following result.

1. Object $\frac{55}{40}$ at 10 inches, $\frac{400}{40}$. Double focal distance

$$2 - 1 = \frac{1}{1}$$

Ground glass screen at 10 inches, $\frac{400}{40}$

Picture measures same as object, $\frac{55}{40} (\frac{1}{1})$

2. Object $\frac{55}{40}$ at 20 inches, $\frac{800}{40}$. $4 \times f. d.$ $4 - 1 = \frac{1}{3}$

Screen at $6\frac{34}{40}$ inches $= \frac{274}{40}$. ($200 + \frac{1}{3}$ of $200 = 267$)

Picture measures $\frac{18}{40}$. ($\frac{1}{3}$ of $55 = 18.33$)

3. Object $\frac{55}{40}$ at 40 inches, $\frac{1600}{40}$. $8 \times f. d.$ $8 - 1 = \frac{1}{7}$

Screen at $5\frac{33}{40}$ inches $= \frac{233}{40}$. ($200 + \frac{1}{7}$ of $200 = 228.5$)

Picture measures $\frac{8}{40}$. ($\frac{1}{7}$ of $55 = 7.857$)

4. Object $\frac{55}{40}$ at 80 inches, $\frac{3200}{40}$. $16 \times f. d.$ $16 - 1 = \frac{1}{15}$

Screen at $5\frac{18}{40}$ inches $= \frac{218}{40}$. ($200 + \frac{1}{15}$ of $200 = 213.33$)

Picture measures $7\frac{1}{2}/80$ or $3\frac{1}{4}/40$. ($\frac{1}{15}$ of $110 = 7\frac{1}{3}$)

Using a 10-inch lens in the same way, the result is as follows:

1. Object $\frac{55}{40}$ at 20 inches, $\frac{800}{40}$. $2 \times f. d.$ $2 - 1 = \frac{1}{1}$

Screen at 20 inches, $\frac{800}{40}$. ($400 + \frac{1}{1}$ of $400 = 800$)

Picture measures $\frac{55}{40}$. ($\frac{1}{1}$ of $55 = 55$)

2. Object $\frac{55}{40}$ at 40 inches, $\frac{1600}{40}$. $4 \times f. d.$ $4 - 1 = \frac{1}{3}$

Screen at $13\frac{30}{40} = \frac{550}{40}$. ($400 + \frac{1}{3}$ of $400 = 533$)

Picture measures $18\frac{1}{2}/40$. ($\frac{1}{3}$ of $55 = 18\frac{1}{3}$)

3. Object $\frac{55}{40}$ at 80 inches, $\frac{3200}{40}$. $8 \times f. d.$ $8 - 1 = \frac{1}{7}$

Screen at $11\frac{25}{40}$ inches $= \frac{465}{40}$. ($400 + \frac{1}{7}$ of $400 = 457$)

Picture measures $\frac{8}{40}$. ($\frac{1}{7}$ of $55 = 7.857$)

The screen or retina has been moved with each change of distance.

Repeating operation and introducing refracting power to represent accommodation, the screen remaining in same place, at the principal focus, *i. e.*, reducing capacity of lens, or size of its ray.

1. With a 10-inch (24 unit) lens at 80 inches having a +15U and $-12U = +3U = +80$ -inch lens in front and close up, the focus is $\frac{5}{40}$ inch longer than 10 inches and it requires one more unit to bring it down to a trifle less than 10 inches. From $10\frac{1}{4}$ to $9\frac{1}{8}$ inches. Thus 4U instead of

3U or a 60-inch instead of an 80-inch focus, are needed for a distance of 80 inches in this case.

Picture now measures $6\frac{1}{2}/40$ inch or $\frac{1}{8}$ of $\frac{5.5}{4.0}$ instead of $\frac{1}{7}$.

* 2. A 10-inch lens at 40 inches takes a +40 and 1U more = 7U to bring focus to 10 inches. Thus 7U instead of 6U or a $34\frac{2}{7}$ -inch instead of a 40-inch focus, are needed for a distance of 40 inches, in this case.

Picture now measures $13\frac{1}{3}/40$ inch or $\frac{1}{4}$ of $\frac{5.5}{4.0}$ instead of $\frac{1}{3}$.

3. A 10-inch lens at 20 inches takes a +20 inch and 1U more = 13U to bring focus to a trifle less than 10 inches. Thus 13U instead of 12U, or an $18\frac{6}{13}$ -inch instead of a 20-inch focus, are needed for a distance of 20 inches, in this case.

Picture now measures $27\frac{1}{2}/40$ inch or $\frac{1}{2}$ of $\frac{5.5}{4.0}$ instead of $\frac{1}{4}$.

The difference, equal to power of a 240-inch focus, in length of focus, appears in the previous experiments also. The position of the nodal point with respect to the zero of measuring rod may be a factor. But that this is not the reason will be very evident upon a little investigation.

The length of focus for a single ray is seen to be equal to the focal distance for parallel rays, added to a certain fraction of this distance. This fraction has one (1) for a numerator, and for a denominator the multiple the distance of the object is of the focal distance for infinity less one (1).

Thus if the lens is a 40-inch lens (6 units) and the object is 80 inches in front of it, the focus will be 40 inches + $(\frac{1}{2-1}$ or $\frac{1}{1}$ of 40) = 80 inches, and the chord subtending the curve of the picture will be the same as that of the object, *i. e.*, the picture is the same size as the object.

Moving the object to 120 inches distance, the focus should be 40 inches + $(\frac{1}{3-1}$ or $\frac{1}{2}$ of 40 = 20 inches) = 60 inches.

If the object is at eleven times the focal distance for infinity the focus will be 40 inches + $(\frac{1}{11-1}$ or $\frac{1}{10}$ of 40 inches = 4 inches) = 44 inches.

Reversing the process, we get the size and distance of objects; *e. g.*, focus 44 inches, deduct 40 and 4 remains, dividing this into 40 gives 10, which is the multiple the

object is of the picture linearly. Adding one to the 10 gives us 11, which is the number of times the distance is of the length of principal focus, measured from optical center.

The object is 10 times the picture in a line joining its opposite points. The distance is 11×40 or 440 inches to the point on the principal axis on which the chord crosses it. This method considers two points in the field and measures and imaginary line between them, the chord of a curve.

The corresponding elements of the picture and object will therefore be in the same proportion as this fraction, the arcs of the two being measured by their chords.

Arcs of similar sectors of circles (having same angle) are proportional to their chords, and also to the radii and diameters of the circles.

The same proportion must exist where the object is larger than a single ray, between its arc and the arc of the picture, because one being a multiple of the other their division or multiplication by the same number would still be proportionate or a multiple, and consequently the parts of circles whose arcs they are would be proportional. Each ray, however, would continue to have its own nodal point.

To illustrate this practically and at the same time the length of focus, take a piece of cardboard upon which is a strip of black paper 220 fortieths inch long and say half an inch wide, representing the diameter of a circle four times that of the diameter of the circle we have been using, and a 12-inch (20-unit) lens in the slide of our rod apparatus, the cardboard illuminated by direct and reflected light mixed. We will start at three times the focal distance of the lens, or 36 inches. According to the rule the picture should be found at 12 inches $+ (\frac{1}{3} - \frac{1}{1} = \frac{1}{2}$ of 12 = 6 inches) = 18 inches behind the lens, which is just where it is found. The picture should be $\frac{1}{3} - \frac{1}{1} = \frac{1}{2}$ of 220 = 110 fortieths, and this is found to be so.

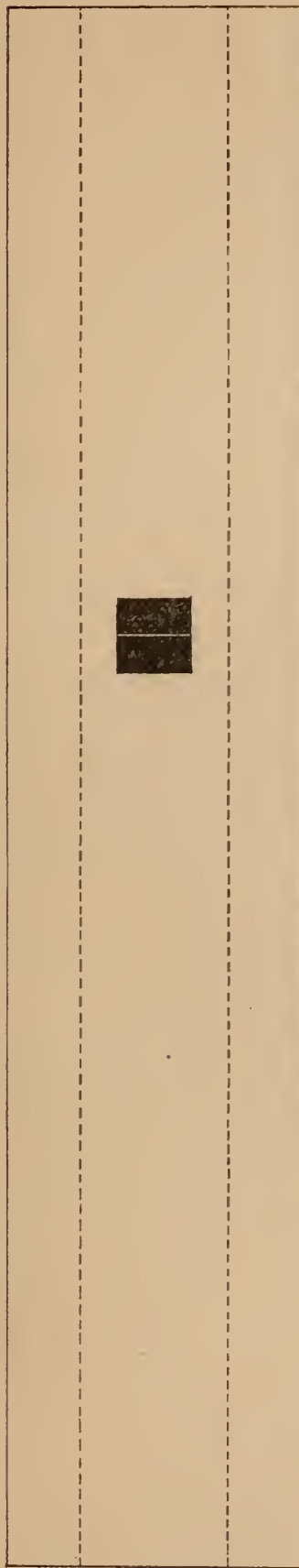
At 72 inches, or 6 times, we should have for focus 12 +

($\frac{1}{6} - \frac{1}{1} = \frac{1}{5}$ of $12 = 2\frac{2}{5}$ inches) $= 14\frac{2}{5}$ inches, and for the picture $\frac{1}{5}$ of 220 or 44 fortieths. This also proves. At 108 inches, or 9 times, we have a ratio of $\frac{1}{8}$, calling for a focus of $13\frac{1}{2}$ inches and a picture of $27\frac{1}{2}$ fortieths. The measurements correspond in this instance also.

The pupil would seem to shut off light except such as is the width of the ray suited for the distance. It would seem to the writer that the experiment of Dr. Scheiner furnishes one means of measuring the width of the ray. The two openings cutting out sections, the distance between the openings measuring the ray when the images are united.

To accomplish this an instrument is readily made as follows (fig. 3): A slit $\frac{1}{50}$ inch wide is cut in black paper. The slit $\frac{3}{4}$ inch long. Two slits of the same width are cut in a long piece of the same kind of paper, inclined to each other so that they run together at one end, the axes meeting at a point a definite distance from another point at which the axes are a known distance apart, say $\frac{1}{5}$ inch. The distance to point of union being 5 inches. If the 5 inches is divided into 200 parts, fortieths of an inch, a movement of the slide along a line equal to one of the divisions would equal a change in approximation of the two long axes of $\frac{1}{1000}$ of an inch. Now arranging the two pieces of paper to slide over each other, the three slits form two nearly square openings, which will vary their distance apart as the pieces of paper are moved. Arranging a zero mark we can measure in thousandths of an inch the distance apart of the centers of the holes. If we have long slits at other angles, say the ends $\frac{1}{10}$ or $\frac{4}{10}$ inch apart, we can measure with the same divisions (200 in 5 inches) the separation in $\frac{1}{2000}$ and $\frac{1}{500}$ respectively, and with the more widely separated slip will have a range from zero to $\frac{2}{5}$ inch. There can also be a slide with a single slit, running from nothing to a width of $\frac{1}{50}$. This will measure in $\frac{1}{10,000}$.

With such an instrument we can also, knowing their diameters, measure the distance of luminous objects, as for example the sun. Held in the sunlight the instrument



PROJECTION OF END

IN 1 - 2000 INCH

KNOB

FIG. 3.



IN ~ 1 - 1000 INCH

KNOB



PARALLAX METER

casts a shadow upon a white card, with the light coming through the two holes appearing as two round disks. On moving the slide, the disks approach or separate. Have the card at a known distance and take the reading of the index when the disks touch, the measure of the diameter of the disks. We have then three triangles, parts of which are of a known size; two with the center of each in line with the centers of the openings in the instrument and the center of the sun, and one with a base extending between the centers of the two disks, the sides extending to the center of the sun. The length of the base is known. The diameter of the openings is known, and the distance apart of the centers of the openings is known. From this we should be able to calculate by simple proportion the distances of the apices and so the parallax or angularity of the sunlight. Applying this to the known diameter of the sun, from the astronomy, we should get an idea of its distance. The refractive power of the atmosphere influences the result, contracting the size of the disks more or less as it is greater or less, also the time of day and year should influence.

With this simple crude apparatus the observations produce a remarkable result.

At the distance of 10 inches the parallax meter measures $\frac{1.00}{1000}$ inch. At 20 inches it measures $\frac{1.85}{1000}$. Now taking the axes to be parallel, which is not the case exactly, we will consider the reading of the index to equal the diameter of one of the disks, since when the edges of the disks touch, the centers must be separated by a distance of two radii, we will have for one of our triangles a base of $\frac{1.85}{1000}$ and at a point in its length a section equalling $\frac{2.0}{1000}$. This distance is $\frac{2.0000}{1000}$. Now as the diameter of the base is to the diameter of the section, so is the distance between base and section to the distance between section and apex.

The last or unknown term is found to be $2\frac{1.62}{1000}$ inch.

This then is the half length of a ray of sunlight measuring $\frac{1}{50}$ inch diameter. Its length would be 4.3 inch with a central point, according to our method.

Adding the two distances we have another triangle in which the base, 185, and the altitude, 22.162, are known. Now taking the diameter of the sun from the astronomy as 852,900 miles, we can make the following proportions, $185 : 22.162 :: 852,900 : \text{the distance}$.

In taking the observation we found a discrepancy between the distances used. At 10 inches the index read 100. At 20 inches it read 185. Should it not have been 200? Say there was a loss of $7\frac{1}{2}$ per cent. due to atmospheric and the influence of the inclination we disregarded, making our disks that much smaller and the final result that much too great.

Making our calculation, allowing this and for rotundity, the result is a summer distance of 94,618,023 miles. It varies 3,000,000 between winter and summer.

If we allow the $7\frac{1}{2}$ per cent. on our length of ray, dividing by 1.0750, it will equal 4.02 inches.

The inclination of the axes, disregarded, could only be as that of the sides of a triangle whose base is $\frac{185}{1000}$ inch and altitude about 94,000,000 miles, so that the discrepancy between the readings must be due to atmospheric refraction contracting each ray about its center, and principally to faulty construction.

Military signaling with the heliograph, in which the sun and mirrors are used, corroborates this estimate of the angularity of the sunlight.

It is found the light is projected in a circle of illumination which has a diameter increasing $16\frac{1}{3}$ yards for every mile of distance, and this is the same for all sized mirrors; but is brighter the larger the mirror. A mile equals 5280 feet; $16\frac{1}{3}$ yards equals 588 inches. One foot distance corresponds to a diameter of .1114 inch, $\frac{1}{8}$ foot or 2 inches distance to .0186 inch diameter, which is .0014 inch less than $\frac{1}{50}$ of an inch (a deficiency on the .0186 inch of 7.52 per cent.). Twenty inches or ten times 2 inches would correspond to $\frac{186}{1000}$ diameter.

If we calculate the inclination of the refracted sunlight upon this basis we might get an idea of the amount of

hypermetropia the earth has, considering the surface as the retina, and thus explain why and how much hotter it is when the atmospheric surface is further away than when it is nearer, as well as sundry other natural phenomena.

The two cones of light thrown into the eye when looking into the distance through this apparatus can be made to change their amount of separation, and their bases, two disks, made to just touch so that there is no obstruction in the field of vision. On fixing nearer objects the disks will appear to separate, a black bar showing in the field. The openings can be approximated and the difference of separation measured. Considering these disks, the picture of the pupil, to measure by their diameters, the inclination of the refracted light in the eye, and that their separation equals the width of the ray instinctively cut out by the iris, there are certainly some noteworthy coincidences connected with the measurement and the length of the sunlight ray and far point of the eye.

The ordinary daylight is considered to be the reflection from the particles in the atmosphere and from various objects, and if we consider the angle of reflection equal to the angle of incidence, this diffused or reflected light must have the same angularity between its parts as the original direct sunlight.

If we take the length of a ray of sunlight, as already spoken of, to measure, say 4.5 inches, for a diameter of $\frac{1}{50}$ inch, one $\frac{8}{50}$ in diameter should be 36 inches long and one $\frac{24}{50}$ in diameter should be 108 inches long, one $\frac{50}{50}$ in diameter should be 270 inches long.

Measuring an eye while viewing an object distant 50 or 60 feet the index reads $\frac{155}{1000}$. Without changing the openings the eye looks through them at the flame of a candle in front of which is a piece of dark blue glass. At a distance the red and blue bands of color are not seen, but two images of the flame are still visible. Moving nearer, to $2\frac{1}{2}$ feet, the double image disappears.

Now say an eye measuring .155 must be at 60 inches from a surface to see clearly, a .155 ray would have its center at

$2\frac{1}{2}$ feet, a .31 ray its center at 5 feet, and a 1.24 ray its center at 20 feet. This would place the center where the end of a ray of sunlight is supposed to be, or give double the angularity to its parts.

The first perfect picture formed by a lens is where the object is at twice the distance of the principle focus for light from a point. A surface non-luminous must then be twice as far off to have the same angularity in the parts of its ray of light.

If we take the sunlight ray as a basis and the sun as a surface we would have the length of a ray about 200 times its diameter. Applying this to this eye we may say $\frac{1}{200}$ of the distance of far point equals the diameter of the ray for that eye for a surface and $\frac{1}{100}$ for a point.

For a surface 60 inches, diameter of ray .3.

For a point 30 inches, diameter of ray .3.

Now taking this eye as equaling the measurements usually given, its ray would on above basis be half the width of cornea and half the distance of nodal point to retina.

A lens of — 60 inches equals $\frac{1}{4}$ of 20 feet in focus, and if we increase the diameter of the ray four times, $4 \times .155$, we would have a ray equal to the average width of the corneal surface, thus making the ray larger.

A plus lens is stronger when farther removed from the eye. A minus lens is weaker under the same circumstances. The cone of light has its apex in the first case pointing toward the eye, in the second case away from the eye. When the distance is changed the cornea intercepts a different diameter of the cone, where it is smaller or where it is larger. The effect must be to make a smaller ray to enable closer vision, and to make a larger ray to enable more distant vision. That is, the more distant the source the larger the ray.

Contracting the aperture in a lens we have seen brings up the nodal point, making a shorter focus, not however to the same extent as shortening its radius of curve. A lens of the same curves but thinner, and consequently of smaller extent of surface, will have the optical center nearer

the anterior surface, otherwise this center cannot be midway between the surfaces. This would constitute an action similar to an increase of refractive power, because it makes the image smaller and brings the focus nearer, as experiment shows.

A pupil in front of a lens not only allows a shorter focus, but if small enough shuts off so much of the refracted light that a longer focus is also produced, giving a longer range, and forming an image like that by a pin-hole without a refracting medium, but a much fainter picture.

Does the pupil measure the ray? Does it become pin-hole to overcome want of power or excess of power? Thus having two distinct offices.

The latest work on the eye (Fuchs), claims a myope can see as well as others if the pupils are contracted. The stenopæic hole shows the same.

When two candle flames are viewed through a piece of blue glass at a greater distance than that of clear vision, the light appears in two colors for each flame. When a certain distance is reached, advancing toward the candles, the colors disappear and the flames appear of the color of the glass, but still the two flames are seen.

These two sources of light are pictured upon different parts of the retina and consequently their axes must have crossed. These colors will be seen when a piece of blue glass is placed in front of a lens and a radiant focused and the screen moved slightly, just as they are in the eye. They are quite distinct when a disk with two small openings near the periphery is interposed.

From this it is assumed there are, for each ray, two nodal points in the eye, one at which the axes of separate rays meet and intersect, and one at which the parts of the ray meet, and cross, if the retina is not at that point. The nodal points for parts of rays should be as numerous as the rays and correspond with the centers of our imaginary circles.

The arrangement of the rays is shown in projection on a plane in Figs. 4 and 5.

A·a AXES

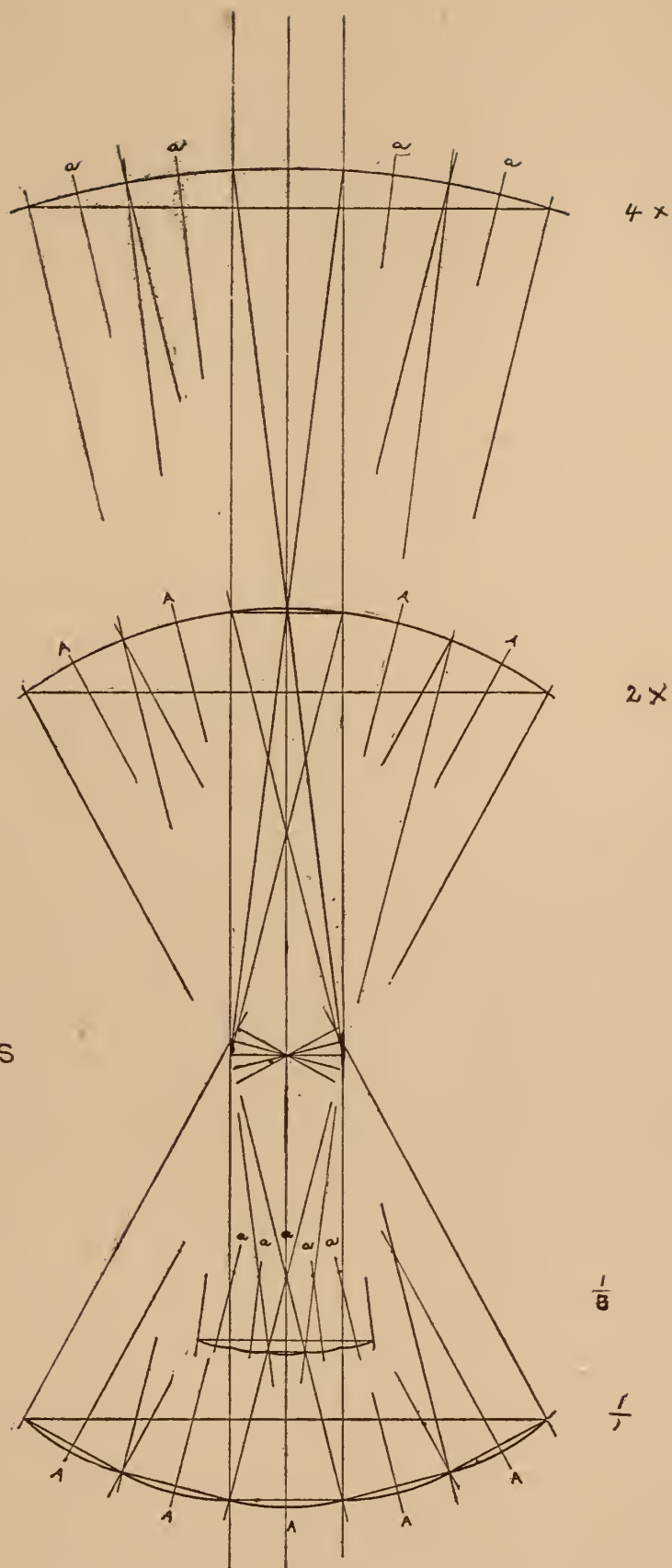


FIG. 4

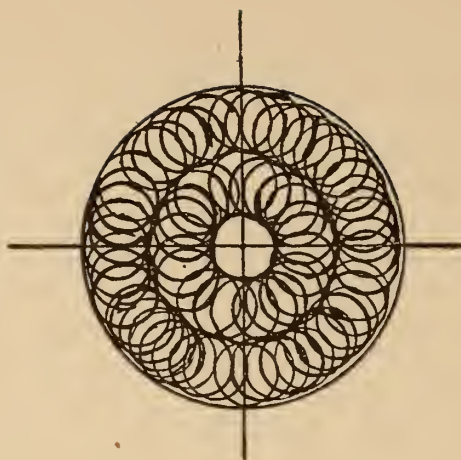
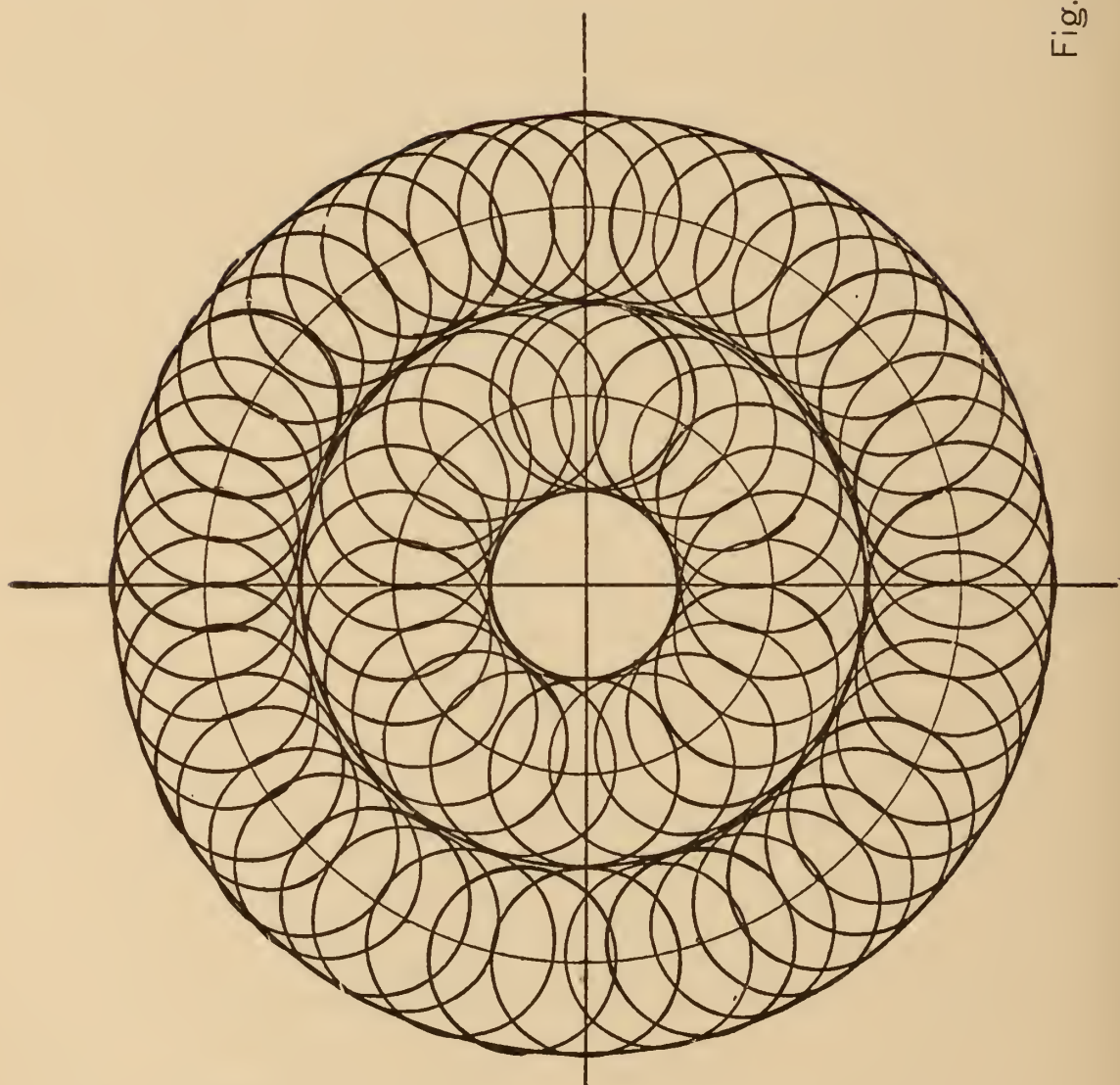


Fig. 5

The central ray is surrounded by innumerable rays in circles. The centers at regular distances, forming a continuous circular line. All points of this line as well as all points in its parallels are each in each, equidistant from the principal axis and from the axis of each ray.

These circles of centers and peripheries of rays are "small circles" of a sphere, as are also those belonging to each individual ray.

There can be no prismatic refraction on the circle of these rings in the direction of the curve since this line with its mate on the other side of the lens is in the condition of a plane medium, all the parts of the two being an equal distance apart.

At right angles to this, or across the ring, there is refraction, and it divides itself into larger or smaller width rings according to the width of the lens' ray.

Thus in the individual ray the refraction is toward the center of the ray, in the ring as a whole the refraction is toward the line of centers. The light or effect as a whole has the same proportionate influence impressed upon it as upon any single part.

These rings of influence (or color) are then a result of a geometrical peculiarity in connection with the size of the ray.

Any part of light has the same proportion between its parts as the whole has between its parts, and we may have a ray of sunlight the fiftieth of an inch or less in diameter, or eight thousand miles or more in diameter, and the two will be similar geometrically and have their integral parts and similar parts in the same proportion.

As is well known atmospheric air possesses a power of refracting light which from the shape of the mass is similar to that of a lens of any other substance, and it is this property in connection with parallax which is the most useful to man. Without it the earth would become a barren waste covered with ice. Even now in the tropical zone one only has to ascend certain high mountains to reach a region of perpetual snow and ice. In ascending,

one goes further from the focus, puts himself in the position of the retina of an exaggeratedly hypermetropic eye. This loss of heat is stated to be one degree for every *three hundred feet*, and at sixteen thousand feet above the sea level we reach eternal winter.

From the foregoing it is very evident the length of principal focus bears a proportion to distance of object and size of picture, but half of it has not yet appeared to equal the width of the ray of light. This half—the chord spoken of—has undergone the refractive action, and is smaller than the width of the light striking the surface. The size of this latter should be equal to the double tangent of the arc of the chord.

If we say the outlines of objects become the centers of new rays which would then have their ends at double the distance, and taking our chord as a factor at eight times to represent this in the combination where the picture equals the object (see Fig. 4), we would have for the eye measuring .155 a width of light eight times .155, or 1.240 inch. This multiplied by 200, the assumed proportionate length of a ray, gives 248 inches as the far point for light of that eye. The distance of the points in the margin of objects would be half that, or 124 inches. This is just about the amount of myopia this eye has.

The two points in the margin of object are seen to lie in the end of two rays which adjoin, making at that distance a double width. At double the distance these two rays have separated enough to contain the principal ray between them, making a width of three rays, two becoming three at double the distance (see Fig. 4).

We thus, for light, have twice as many rays less one in the same plane whenever the distance is doubled, the central or principal ray never multiplying.

This double distance for light makes points in the object the center of its ray, and gives the same proportion between the length of cosine of the light circle ray and the length of principal focus as there is between the length of the cosine of the object circle ray and the width of the ray or

double chord. Consequently the same number will be the factor for both terms of the proportion.

It will be observed also that as in practice it is necessary to measure the refraction with a single ray, so here a single ray gives the closest measure.

It will be noticed the outer edge of the ray of which the edge of the object becomes the center does not extend out from the principal axis further than half the width of the principal ray added to its own width; this, with the corresponding effect on the other side of the principal axis, gives a whole width of "three" at this distance, to correspond with a width of "two" at the distance of the object; because, as will be observed, the inner margins of these two outside rays here cross each other on the principal axis, making a diameter's width on each side of it. Therefore the chord of the light is to the chord of the object as 3 is to 2. The sines or half the chords are in the same proportion. It is evident these inter-relations must prevail for all distances of the object.

Our whole plane projection is to be revolved about the principal axis, and each ray about its own axis, to fill up the space of solid light.

In connection with this subject of size and increase an exceedingly important experiment may be tried. I focused a small black area on a white background at twenty feet distance with an eight inch (30 U) lens, having a plus 4 U and a minus 3 U lens in front of it. The picture on the screen was a single dot. Removing now the two weak lenses (1 unit), leaving the 30 U lens and not disturbing the relations of the object and screen, the conditions corresponded to emmetropia with the object at twenty feet. The picture on the screen was now double, the two dots showing with a considerable distance of separation. The object area was formed by an apparatus which enabled me to increase and diminish its size and at the same time measure the proportionate changes. It was of the size corresponding to the small divisions on the twenty foot line of the test types, and as near as I could make it, equal to an arc

of one minute on a radius of twenty feet. The two pictures of the single dot had indistinct outlines, and in order to cause the two pictures to merge into one it was necessary to increase the object area to four diameters. The same phenomenon took place with a single line.

These same experiments when tried with two units of ametropia required an enlargement to eight diameters to merge the images.

The merged image had indistinct outlines, but it was a single image only, though of course larger than either of the double ones.

Now is the explanation of this in light, in parallax, in atmospheric refraction, in the position of the lens (this was changed without making difference until after extended motion); is it in a crystalline condition of the glass, in the structure of a ray, each lens having its own; is it because each surface of the lens has its picture; is it that there is only one picture in the lens—that on the posterior surface, and the two sides of the lens make two shadows; is one image shadow and the other refraction, or is one reflected? Why is it the same with a line perpendicular as well as at all other angles, revolving it about its middle?

Space does not admit of more remarks except to add that an endeavor should be made to point out the similarity between the final result of the phenomena of refraction and the geometrical relations existing between a sphere and a contained figure of four sides, a tetrahedron.

THE ELECTRO-CAUTERY IN DISEASES OF THE NOSE AND THROAT.*

BY THOMAS L. SHEARER, M. B., C. M., EDINBURGH,
BALTIMORE, MD.

Among the instruments which one finds, at the present day, in the well equipped office of the modern laryngologist, none have received more attention from him and none have caused him more trouble than the electro-cautery. Day by day one hears of improvements in storage batteries, each one of which has claimed for it, by its maker, some special advantages not possessed by yours, which by the way you may have purchased only recently at a considerable expense. Now, as the only way of finding out the merits of any instrument, and particularly an electrical one, has been to purchase it and give it a practical trial, most of us specialists have for some years past followed this plan with regard to cautery batteries, hoping in each case that we would at last obtain a satisfactory apparatus. But what has been the result? In a certain nook in an office belonging to a friend of mine is a spectacle, the beholding of which has stirred up more emotion than a graveyard, whose tombstones are covered by well-chosen, touching epitaphs. Upon closer inspection one sees a pile of old useless cautery batteries, each one of which has been more expensive than its predecessor, and naturally one wonders how long this will continue before we succeed in obtaining a good serviceable battery upon which absolute reliance

* Read before the National Society of Electro-Therapeutists, New York, September 28, 1893.

can be placed. When Middelkorpff* introduced this instrument in 1854, he little dreamed of the wonderful popularity which it was destined to attain and of the great sphere of usefulness it was to occupy in the treatment of diseased conditions; for it is used in all those pathological states in which the chemical caustic used to be employed. Now surgeons can take their choice between them, though the majority of operators prefer the galvano-cautery, as it is more convenient, more readily managed, its caustic effect can be better limited, and it is less painful. It occurred to me, in view of the increasing size of the field which the electro-cautery is now occupying, that it might not be amiss to bring before this meeting the latest views with regard to its use in diseases of the upper air-passages. And in doing this one is led to the conclusion that, while nearly all operators have on many points strong individual ideas and opinions, yet in the main they are agreed upon certain definite rules which should govern the safe use of this powerful agent.

First. It is almost needless, and seemingly absurd, to remark that before the application of the cautery, or any other agent, as accurate a diagnosis as possible should be made. If any reasonable doubt exist concerning the pathological state of the part to be attacked, do not do something which will only throw discredit on the instrument and possibly injure your patient. Apropos of this, I am reminded of a young man who consulted me two years ago for the removal of a nasal polypus. He said that he had been under treatment for some weeks and that his physician (a general practitioner) had been burning out his polyp with electricity; he further stated (quoting his physician's words) "that the growth was a very large one, and that a considerable part still remained which he intended to destroy in the same way." At this time, the patient complained of excessive pain in the fronto-nasal region, headache, and was annoyed by the constant discharge of pus which was at times very offensive. Examina-

* "Die Galvano-Kaustik," Breslau, 1854.

tion of the part convinced me that the enthusiastic operator had mistaken the middle turbinated membrane, increased in size as it often is on the larger side in cases of markedly deviated septum, for his polypus, and he attacked it accordingly. Why he did not try the cold snare if he thought his diagnosis a correct one I leave you to imagine. The result of this blind and inexcusably unscientific treatment was a sloughing necrotic mass which at that time threatened to involve the entire ethmoid bone, and which ultimately caused complete loss of the middle turbinated bone on the affected side. This case prior to his cautery treatment had no discharge from his nostrils, no history in the least suggestive of a polypus, and certainly presented no indications for such a ferocious onslaught. Another case, interesting chiefly on account of the extraordinary therapy employed, was a young lady, æt. twenty-eight years, a professional singer, who consulted a well known laryngologist for an acute affection of the throat with ulceration, from which she was then suffering. But, although after several days the ulceration disappeared, she still complained of great pain on swallowing, especially on the left side, and found attempts at singing very distressing to her. Her physician, for some unknown reason, evidently located the cause of these symptoms in the left tonsil and made a variety of local applications to this region, as a last resort making very free use of the cautery. Her symptoms became very much aggravated by the latter agent, as it had been unsparingly employed, and when he finally said that she had also a number of varicose pharyngeal veins which were complicating matters, and which would have to be rather heroically treated, the patient became alarmed, and through the advice of friends came to me for an examination and an opinion. I found a very simple state of affairs: There was nothing unusual about the pharyngeal veins except temporary over-distention from the resistance to the circulation resulting from swelling of the mucous membrane. The tonsils (except from treatment) were nearly normal; the larynx was

slightly congested, and, in short, her case proved to be a severe rheumatic condition involving the muscles of the hyoid region and the intrinsic laryngeal muscles as well. Of course, internal remedies very promptly relieved her. The words "careful diagnosis" can never be too prominently displayed before the student.

Secondly. In using the cautery, it is imperative that one remember the special functions of the parts about to be operated on. Upon this point will depend largely the probable degree of punishment which one may safely inflict upon the region. It is, for instance, always important in operating for the reduction of posterior turbinated hypertrophies, especially when situated close to one of the Eustachian orifices, to remember that "acute * Eustachian salpingitis, with subsequent inflammation of the middle ear, often of a purulent and destructive character, is a very common complication of such cauterizations." With this fact before me I have always used the cold wire snare when it was possible; if I could not get at the hypertrophy in that way, the cautery was employed, care being taken to produce as small burns as may be consistent with the required result. The nearer one comes to the posterior nares, the more cautious one should be in making such applications. When the hypertrophic process involves the main portion of the turbinated membrane and we find that there is no indication for the use of the snare, we look to the cautery for the relief of this condition. However, in availing ourselves of this therapeutic measure it is necessary to bear in mind that one must not destroy any more tissue than is absolutely required in each case, lest the formation of the cicatrix, added to the natural tendency of hypertrophic tissue to contract, result in an atrophic rhinitis and consequent impairment, if not absolute loss, of the function of the part. It is best to introduce the electrode perfectly cold into the nostril, and having placed it as far back as the diseased condition seems to demand, the edge of the platinum knife is pressed against the membrane, the cur-

* Seiss, "System Diseases, Ear, Nose, and Throat," vol. i.

rent is turned on, and as the instrument is drawn forward at a full red heat a linear shaped incision of moderate depth is made. Casselberry,* describing the technique of galvano-caustic application for hypertrophic rhinitis, recommends that the electrode be heated to a white heat, as contact with the moist tissue reduces the temperature practically to a red heat. He further advises that the heated platinum point be drawn over the same linear eschar a second and a third time at one sitting, in order to deepen the furrow mapped out by the preliminary incision.

My own experience prompts me to proceed more slowly in such cases, as it is always an easy matter to cause more contraction of the turbinate tissues when we require it, but very difficult to undo the effects of too much cicatricial tissue formation. It appears to me, therefore, better practice to make a single application at one sitting, and carefully note the amount of contraction which follows. One should always see that the electrode is removed from the membrane while it retains its heat, as otherwise hemorrhage may result from the eschar becoming adherent to the knife and being torn away. An interval of at least one week should elapse between the first two treatments, and a longer time between the subsequent ones. In each case the number of applications must be governed by the effect produced by the preceding cauterizations.

It is well to bear in mind the possibility that the owner of the nose, upon which you are operating, may occasionally desire to use his sense of olfaction, and that his future efforts in that direction may be seriously interfered with if you insist upon placing yourself on record, not as the author of roast pig, but of broiled turbinate. The point of all this is: avoid as much as possible the use of the cautery above the line of ordinary respiration; if you must invade the region in which is located the sense of smell, do it with at least some intelligent appreciation of the neighborhood.

Thirdly. What position, at the present day, does the

* "International Clinics," vol. iii. Second Series.

cautery occupy in the treatment of cases of paroxysmal sneezing, rose cold, and hay fever? When should it be used and how is it supposed to do its work? In answer to these questions I shall quote the opinion held by Bosworth* as expressed in his recent excellent article on hay fever. "The active discussion of the subject of hay fever and its curability has been largely carried on by those who have made a study of diseases of the throat and upper air-passages, and I think it is fair to claim that the most successful results in affording relief from the disease have been attained by methods of treatment directed toward the removal of such morbid conditions as may be found in the nasal passages. If the results obtained by these observers can be relied on, it seems to me that a causative relation to catarrhal affections in the upper air-tract is clearly established, and in this point of view therefore becomes of special importance, in that we have here definite conditions which can be recognized on ocular inspection, and definite indications for treatment. The treatment is not new, for as early as 1837, Cazenave† recommended that the mucous membrane of the nose should be cauterized with nitrate of silver. This plan seems to have been attended with a certain amount of success until the galvano-cautery was introduced by Middelkorpff, when the use of this device became a favorite procedure. These measures were used without any definite recognition or indications. Of course we do not treat hay fever with caustics in this manner, but we occasionally find it necessary to resort to this measure for the removal of those morbid lesions in the nasal passages which predispose to the disease. These are hypertrophic rhinitis, deflections of the septum, nasal polypi, naso-pharyngeal catarrh, and indeed any obstructive lesion in the upper air-tract which tends to induce a turgescence of the blood vessels in the nasal mucous membrane. The indications for treatment, therefore, are only made clear by a careful inspection of the parts and a recognition of such

* "Diseases of the Nose and Throat," vol. i. p. 85.

† *Gazette Médicale*, p. 31; Paris, 1837.

lesion as may exist. If nasal polypi or other tumors are discovered, they should be removed; if a deflection of the septum exists, the normal patency of the passage should be restored by its ablation; if hypertrophic rhinitis or chronic hyperæmia of the nasal mucous membrane is found, this should be reduced by the judicious use of caustic applications. Sajous lays special stress on the superficial cauterization of the nasal mucous membrane, by which nutrition is altered. This seems rather obscure and fails to give us any definite clinical indication. In a later contribution the same writer (Sajous), emphasizes the necessity of confining the caustic applications to the sensitive areas in the nose as previously described by John N. Mackenzie.* The importance of these areas of John N. Mackenzie I have always regarded as being greatly overestimated. They are simply found in that portion of the nasal mucous membrane where the turbinated bodies are most highly developed. This, unusually high development necessarily entails an unusually rich nervous distribution for the regulation of functional activity. These portions of the nasal mucous membrane, therefore, where the venous sinuses which form the turbinated bodies are more largely developed, are unusually sensitive. This sensitiveness is merely an adventitious feature, and does not carry with it any indications for treatment; they belong to health as well as disease. The indications in hay fever are the control of turgescence, and not the destruction of tissue or the abolition of hyperæsthetic conditions. I am disposed to think that such success as has been obtained by cauterizing these sensitive areas has been simply from the reduction of turgescence accomplished in this way." I have quoted these views in full as they represent the very latest expression concerning this interesting subject, they afford an entirely different explanation of the *modus operandi* of the cautery than that previously accepted, and they place the sensitive areas in an entirely new light. My own experience has always led me, however, toward the carrying out of Sajous' prin-

**New York Medical Record*, July 19, 1884.

ciple, viz., to confine the cautery to the regions included in the sensitive nasal areas. I have done so for a number of reasons:

1st. If the treatment of these areas does not produce beneficial results, the chances are that applications to the other parts adjoining would not be any more likely to do so.

2d. While, as a rule, we may not observe any immediately deleterious effect from cauterizing the nasal mucous membrane, still we have no right to presume that the remote and ultimate condition of the parts (judged by a normal standard) will be all that could be desired.

3d. From this standpoint, is it not better to confine, as much as possible, our attention to the areas which are the seat of special hyperæsthesia, whether it be due to a pathological state of the sensory nerves themselves, or to turgescence of the mucous membrane in that locality?

4th. If, as Bosworth says, the indication for treatment in hay fever is the control of turgescence and if, as he observes, the greatest degree of hypersensitiveness is found in those portions of the turbinate membranes where turgescence most readily occurs, then we have an additional reason for considering these sensitive areas in the light of a map which we should use as our guide in the employment of the cautery.

5th. While, undoubtedly, hyperæsthesia of the nasal nerves usually is accompanied by a certain amount of congestion of the membrane in the same neighborhood, it is not an easy thing to demonstrate that the former always depends upon the existence of the latter condition. It is more rational to me to regard the terminal endings of the sensory nerves as the seat of a pathological state or condition which of itself renders the nerve fibers more prone to excitation by various agents which, in the normal nerves, would have little or no effect, and which through vasomotor influences would naturally end in congestion or turgescence of at least that region. This certainly affords us some ground for the localized application of treatment. I

regret that the scope of this paper does not allow of the discussion concerning the part which the central nervous system plays in this class of diseases.

Fourthly. There is a curious set of symptoms to which I have given the name rhinitis herpetica, and which, strangely enough, seems to have escaped the notice of various observers, as in the works covering this subject no mention is made of anything which exactly coincides with this description: The patient suffers from a constant sensation of itching, which is confined to the internal surface of the alæ nasi and which necessitates the placing of the hand against the nose and rubbing it as violently as possible. In addition, there are at times sharp lancinating pains, accompanied by an intense burning in the same region. Sneezing is rare, although sometimes present, while a tendency of the eyes to water, probably from irritation of the nasal branch of the ophthalmic, is occasionally an annoying symptom. An examination of the nostrils reveals an interesting condition: the mucous membrane covering the anterior end of the inferior turbinateds is covered with an immense number of tiny vesicles, of an herpetic nature, and the normal degree of sensitiveness in this area is enormously increased. There does not seem to be any more congestion about the part than would easily be occasioned by such vigorous pulling at the nose. As a rule there is no watery or other discharge from the nostrils. There are, no doubt, some points of similarity between these symptoms and those of paroxysmal sneezing, and yet there are some marked differences. I have only observed the above described conditions in winter; never in any person who suffered from rose cold or hay fever. One or both nostrils may be affected. The treatment which afforded the speediest relief was the application of the electro-cautery. The flat surface of the electrode was applied to the point where the eruption was thickest and repeated at intervals of three or four days in an adjoining spot, and so on until the pruritus subsided. When one thinks of it, the symptoms of herpes zoster, modified, of course, by the difference

between skin and mucous membrane, bear a striking resemblance to this affection.

Fifthly. The position which the cautery holds in the treatment of nasal enchondromata is unchanged, although Newcomb* relates two cases of his own in which he employed electrolysis with very good results, and two foreign observers, Moure and Bergoniet† have written an elaborate monograph on the same method. The employment of electrolysis has the disadvantage of producing severe intra-nasal pain, which is most intense at the point of insertion of the needle, while an increased strength of current is often followed by pain in the incisor teeth. If the method can be so modified as to be rendered comparatively painless, and the patient, therefore, enabled to stand the treatments, each one of which lasts some minutes, there is no reason why the cautery should not be superseded by this procedure. At all events, in the class of cases in which there is any objection to the use of the knife, I think that electrolysis should be given a trial.

Sixthly. As the indications for the use of the cautery in granular or follicular pharyngitis and in hypertrophy of the faucial tonsils are so well known, I shall not consider that subject, but take up the treatment of glandular hypertrophy at the base of the tongue. The methods commonly employed have been the electro-cautery and the snare. Williams‡ considers a cutting operation similar to that ordinarily used in ablating the faucial tonsils as superior to the last named means, and is a strong advocate for the use of Roe's lingual amygdalotome in such cases. This instrument is constructed on the principle of Physick's amygdalotome, possessing, however, a curved shank which allows of the shank being closely applied to the dorsum of the tongue, and the opening in the cutting portion of the instrument is made sufficiently wide to grasp the tissue spread out across

* *New York Medical Record*, August 5, 1885.

† Moure and Bergonie, "Du Traitement par Electrolyse des Déviations," Paris, 1892.

‡ "International Medical Annual," 1892.

the base of the tongue. In doing this operation, or in using the cautery to destroy the glandular mass, the laryngoscopic mirror must, of course, be employed. This is particularly necessary in the cutting operation, as there is a risk of the top part of the epiglottis being shaved off instead of the tissue which lies so near it. In cases where the blood vessels at the base of the tongue are very much enlarged, the cautery should, however, always be given the preference, as nothing can be more embarrassing to an operator than a severe hemorrhage in such a locality.

I have endeavored in these few short remarks to place the electro-cautery where it belongs as a therapeutic agent, to define as exactly as possible its more precise indications for treatment of diseased conditions ; and in doing this, while we must consider it one of the really indispensable instruments in our armamentarium, yet its successful, safe, and judicious employment is absolutely dependent upon its being in the possession of skillful hands. And I would advise anyone who is contemplating the choice of this useful adjuvant to medicinal treatment to have a clear, decided reason in every case for its use. If any doubt exists as to the necessity for it, remember the axiom of Sir Walter Scott, that "when a man has not a good reason for doing a thing, he has one good reason for not doing it"—and follow it.

NASAL EPITHELIOMA.*

BY W. A. DUNN, M. D., CHICAGO.

The advances made in nasal studies since the invention of the modern instruments of examination have made possible the diagnosis and successful treatment of many serious diseases that were formerly considered incurable. This is especially true of the malignant diseases of the nasal cavities, on the early diagnosis of which depend the treatment and prognosis.

The considerations and symptoms surrounding a case of epithelioma of the nasal cavity are not materially different from the same disease in other cavities, if the early symptoms be not obscured by some acute trouble, as was the history of the case I wish to report first.

Mrs. Mary J. appeared at my clinic in April, 1892, and gave the following history : She was fifty years of age, colored, of strong physique, and had always been in good general health until March, 1891, when she suffered from an attack of la grippe, attended by symptoms of cold in the head, nasal stenosis, and cough. This attack kept her in bed six weeks and was followed by dropsy of the lower limbs for three months. During this time she suffered from great pains in the front part of the nose and head from time to time. In February, 1892, she observed a wart-like growth on the lower part of the right side of the nasal septum, with pain in and about the growth, extending into the side of her head. The growth grew rapidly and caused a copious but not offensive discharge. The neighboring lymphatic glands were not involved.

This growth was removed by some solution applied by her

* Read before the World's Homeopathic Congress, June 3, 1893.

attending physician, but in a short time she observed a similar growth on the left side of the septum. This was treated by a snare and forceps, but without apparent success.

The disease rapidly increased and about the 1st of April she applied at my clinic for treatment. For a month past the discharge had been bloody and fetid, with extreme pain in the nose, extending into the face and head.

Her general health was somewhat depressed, yet did not show an extreme degree of exhaustion. The appetite and digestion were good. No history of cancer or tuberculosis could be found, and no injury to the nose that she could remember. She said that a few weeks before, about the time the discharge became odoriferous, she had pulled away a good sized mass of tissue from the inside of her nose, which she described as looking like flesh. From that time the discharge was excoriating, bloody, and offensive. An examination showed the septum to be a mass of ulceration and decomposition. The mucous membrane of the septum was destroyed as far back as could be observed by anterior inspection. The cartilage had become destroyed and was crumbling away. The tissues of the turbinated bodies was swollen but not ulcerated. The ulceration did not include the fibro-cartilaginous band at the cutaneous surface of the septum, but extended high into the nasal cavities, and very far toward the posterior border of the septum.

A section of the diseased tissue was removed and referred to Professor Howard N. Lyon, who submitted it to microscopical examination and pronounced it a typical epithelioma.

As treatment promised negative results, a radical operation was decided upon for the complete extermination, if possible, of the malignant tissue.

The operation was performed April 19, 1892, by following Rouge's method of dissecting the lip and infra-nasal tissue from the maxillary bone and drawing the face upward until the whole of the nasal cavity was exposed.

The growth did not involve the cutaneous rim of the septum, therefore the cartilage and mucous membrane were removed from this portion of the skin, leaving an external septum dividing the opening. All the tissues of the nose were removed as far as the posterior nares, the septum, the middle and inferior turbinated

bones, the maxillary crest, etc., until we felt perfectly satisfied that every vestige of the growth was removed.

The hemorrhage was controlled by hot water and pressure, from time to time, and was not extreme, yet considerable blood was lost. The face was restored to its normal position, and secured with catgut to the maxillary tissues. The cavity was packed with long strips of gauze through the normal nasal openings. The patient reacted well and no unfortunate symptoms appeared. The temperature was at no time above 100° , and she suffered but little pain. The dressing was removed every second day and the wound thoroughly disinfected. There was



considerable depression of the external nose from want of support, and marked tendency to close up the external nasal openings by granulation, which was avoided by inserting a small cannula.

She was discharged May 4, but still appears at the clinic from time to time, to show us that she is in perfect health. This case illustrates the possibility of sometimes saving the life of a patient, in this serious disease, by radical measures, when the usual treatment would be of no avail.

I will refer to a second case equally as fortunate. Mr. S. C. S., Iowa, applied to me for treatment in June, 1891, for an ulceration of the cutaneo-mucous margin of the septum. For a number of months past an ulceration had been gradually destroying the lower portion of the nasal septum and had at this time involved about three-fourths of an inch of the anterior margin, extending into the upper lip and involving the tip of the nose. The end of the septum was wholly destroyed and broken away, being apparently worse on the left side.

The general health had been rapidly depressed to such a degree of exhaustion, that the patient was overcome by the slightest exertion, fainting away from a slight examination or from a short walk or effort of any kind. He had been formerly in good, robust health, having been a man of fine physique. He said that, while he had never suffered an injury to the nose, about six years before an ulceration had occurred at this part of the septum, but which had healed after a few months; and that in April, 1890, he had observed a bloody discharge from the nose attended by scabs, but without odor. The scabs were quickly reformed after being exfoliated.

In January, 1891, he first observed actual ulceration to have taken place, which increased rapidly and spread downward until the middle of the outside of the nose was reached, attended by extremely excoriating and fetid discharge, which grew more intense until he applied for treatment.

The pain was not severe, but the physical weakness and cachexia were very marked. No glandular enlargement was found. There was no history of tuberculosis or other constitutional disease, except in the grandmother on the father's side, who had died of cancer.

A specimen of the diseased tissue was examined microscopically by Professor Lyon, who pronounced it an epithelioma.

Believing that slighter deformity would follow treatment, in this case, by paste than by surgical means, I decided to remove it by the so called paste treatment, in preference to the knife; therefore I applied :

| | | |
|-------------------|-----------------------------|-------|
| R̄ | Zincum chloridum..... | gr. x |
| | Hydrastis can., pulv..... | 3 ss |
| | Albumen (white of egg)..... | q. s |
| M. to make paste. | | |

This was applied twice daily for about a week ; being held in place by adhesive plaster.

At the end of this time, elm poultices were applied until the destroyed tissue came away.

Being fearful that the growth was not entirely removed, the paste was again applied for a few days and afterward treated by poultices. When the tissue had all been removed, application of Mayer's ointment caused rapid healing of the wounded surface.

The advantage gained by this method of cure, in this peculiar location, was the great amount of tissue restored by granulation.



during the healing process ; much more, I am sure, than would have followed an operation by the knife. The lip was completely restored, the end of the nose filled in until only a small notch was left at the tip of the nose and the lower end of the septum.

A photograph taken a few months ago shows but a moderate amount of deformity remaining. A recent letter informs me that for a year or so the nose was very tender, especially to cold air, but now it is quite hardy and of natural color. His general health has been perfect since the operation.

The treatment of epithelioma of the nose has not been very satisfactory and but few cases have been reported as.

cured, and while I am not positive these cases will not yet have recurrence, I do feel the results already obtained have justified the operation. I believe it to be unwise to attempt anything other than radical treatment in such cases. I believe it is useless to attempt operation on malignant growths within the nose without opening the nasal cavity, and I believe that the method pursued in the first operation is the most practical and complete. It gives free and roomy space in the nasal cavity, without danger of marring the contour of the face or disfiguring the surface, and is practically devoid of danger.

I do not believe it possible to remove such growths with a snare or forceps with a degree of certainty necessary in such cases. The electro-cautery I believe to be insufficient and harmful in such cases, as so little tissue can be destroyed at a single sitting, and the application repeated so seldom and the treatment followed by so much inflammation and proliferation of new tissue that the treatment is dangerous and uncertain.

The treatment by paste, where it can be properly applied, is very satisfactory, because it is not so excessive as to produce violent inflammation and is continuous in its action until the growth is removed. It is not applicable, however, to the majority of cases in the nose because of their deep origin in the nasal cavities.

While I have been informed of many successful cases of malignant diseases cured by properly selected remedies, I have not had the courage to try medical treatment in such cases, knowing that such a short time would carry the case beyond the limit of operative interference; and fearing the power of remedies to restore the parts in so short a time and eliminate such destructive cell formation from the nose, I have resorted at once to the surgical treatment and followed it by such constitutional remedies as seemed indicated by the circumstances of the case.

ATRESIA NASI EXTERNI.*

BY E. ELMER KEELER, M. D., SYRACUSE, N. Y.

The extreme rarity of the following case tempts me to place it upon record.

My research has been quite extended among the leading authors of the day, and I have had considerable correspon-



No. I.



No. II.

dence with various well known operators, but as yet have not found a parallel case.

Of course the instances are innumerable where, from dif-

*Read before the New York State Homeopathic Medical Society, October 3 and 4, 1893.

ferent causes, occlusion, more or less complete, of the nares has occurred.

A deflected septum, hypertrophied mucous membrane over the turbinated bones, or nasal polypi have each and severally produced obstruction to nasal respiration.

But in the case of which I now speak, none of these or similar causes entered into the formation of the closure, which was both complete and permanent, the skin forming an unbroken surface over the site of the normal nasal openings.

The patient, George Hoyt, a lad of nine years, was brought to my office through the kindness of my friend Dr. S. W. Potter, of Homer, N. Y., May, 29, 1890, who gave the following history of the case up to that date.

Six months previous the doctor had been called to care for the boy, then ill with typhoid fever. The fever was of a very malignant type and for many days there was an unusual amount of delirium, during which time, unless his hands were constantly and forcibly held, the fingers were continually boring into the nostrils.

For a long time his life was despaired of and, consequently, this picking at the nose did not receive as much attention perhaps as it otherwise would, and subsequently, before the doctor realized what was occurring, one nostril was entirely closed and the other nearly so, the surface appearing as smooth as though skin grafting had been resorted to.

When I first saw the patient, nasal respiration was entirely gone, there being no external opening to either nostril, and where the openings should have been, the skin was smooth and presented little of the cicatricial appearance one would have expected to find.

The picture labeled No. I. is a photograph taken that day, and serves far better than words to show the perfect closure of both nares which then existed.

An attempt had been made to open the nares by means of the knife, which had not been successful. I, therefore, decided to remove the tissue necessary for a natural opening with the aid of electricity.

I employed a platinum knife attached to a two-celled John

Reynder storage battery, and the nares were rapidly made in position and of the proper size without the loss of a drop of blood. Photograph No. II. was taken two days after the operation.

An interesting involuntary muscular action worthy of note occurred during the operation. The instant a free opening was made into the nose the mouth closed itself firmly, although the patient was completely anæsthetized, showing that nature strongly preferred the nose to the mouth as an avenue of respiration.

Our operation was now completed and the photograph shows a perfect nose, but the history of the case is far from complete, for within six weeks the patient returned with the nares nearly closed again.

This time a determined effort was made to remove every vestige of cicatricial tissue, and directions given to plug the anterior nares firmly every night with absorbent cotton.

This was of no avail, and closure was only prevented by a third operation, and this time to prevent contraction I employed, with success, a hollow soft rubber tube which I devised, somewhat similar to a Goodwillie nasal tube, which served the double purpose of preventing closure and permitting respiration. This had to be worn more or less constantly for over a year before it could be said that all tendency to contraction had been overcome.

A letter from the mother under date of August 28, 1893, speaks of the condition at present as being satisfactory in every respect.

I had never before met a like case, and soon found that no one among my circle of professional friends had seen or read of a parallel case. All authorities, so far consulted, fail to mention such a case or the possibility of such a condition occurring.

Synechiæ of the nasal fossæ mentioned by Mackenzie* is a condition of an entirely different nature, being merely membranous or osseous bands between the sides of the interior of the nose, while in this case the closure was entirely external and limited to the cuticle.

Dr. F. H. Bosworth,† in speaking of the external surgery of the nose, makes one division of operations to embrace

* "Diseases of Throat and Nose," p. 332.

† "Diseases of Nose and Throat," vol. i. p. 619.

those involving "incisions through the external integument," but they are solely for the purpose of enlarging the space of the anterior nares for operative purposes, such as the removal of tumors, etc.

Sajous mentions no such condition in his "Diseases of the Nose and Throat," and states in a private letter that "such cases are rare indeed."

To the question as to whether he had ever seen or heard of such a case, he, the same as Dr. D. H. Goodwillie, did not reply.

Dr. J. O'Dwyer, of laryngeal intubation reputation, replied that he "never knew of any case similar to the one described."

Dr. A. H. Smith, physician at the Manhattan Eye and Ear Hospital, wrote: "I have never seen such a case, and none are on record at the Manhattan."

Drs. C. E. Beebe and F. H. Bosworth both wrote me that cases somewhat similar had been seen; but none, as I infer from their communications, arising from other than a purely traumatic source.

Some have suggested that a free use of the knife instead of the galvano-cautery would have produced a more speedy cure, but I should use the same means employed if occasion offered in a similar case, with the addition of the immediate employment of the dilating tubes following the first operation.

Complete nasal atresia as a sequel of typhoid fever is a peculiar complication and this case stands with few fellows, if not entirely alone.

MYCOSIS LINGUALIS.

BY GEORGE H. QUAY, M. D., CLEVELAND, O.

As the works on diseases of the nose and throat make only slight reference to the disease that heads this article, I desire to place the case on record.

Early last spring Mr. G., fifty years of age, blacksmith, came for relief of what his physician diagnosed as cancer of the throat. Some six months before consulting me he suffered with a severe sore throat ; from the history he gave I should say he had pharyngitis. The acute suffering, in a degree, passed off under treatment, yet he continued to suffer with pain on swallowing, shooting pains extending to ears, feeling of obstruction in throat, loss of appetite, but most of all he missed his customary ten or twelve cigars a day, as his physician told him smoking would aggravate his disease. Examination revealed heavily coated tongue, black teeth that probably were innocent of ever coming in contact with a brush, tonsils enlarged but crypts open to the probe, posterior wall of pharynx beginning to take on an atrophic condition, base of tongue thickly studded with light colored projections, many of them extending out fully one-eighth of an inch.

The treatment consisted in spraying with hydrogen peroxide, which had no effect whatever. I then applied four per cent. cocaine; after which, with much difficulty, on account of their being firmly adhered, the fungi were gradually removed, and their seat punctured with the galvano-cautery. Altogether it took some six treatments to thoroughly remove them, but the patient experienced decided relief after the first treatment. He was given the privilege of going back to his cigars ; only to cut his supply down one-half.

Specimens were submitted to Professor White, micros-

copist to the Cleveland Medical College, who makes the following report :

Dr. G. H. Quay, 106 Euclid Ave., Cleveland, O.

DEAR DOCTOR: Have made a complete microscopical examination of specimen sent me. Found the growth to consist of granular matter, epithelial cells and great numbers of bacteria; leptothrix buccalis predominating.

Would say that it was a case of mycosis rather than a case of follicular pharyngitis.

Fraternally,

J. E. WHITE, M. D.

A NEW CHANGEABLE TEST TYPE.*

BY CHAS. H. HELFRICH, M. D., NEW YORK.

Anyone having a large number of refraction cases to test will appreciate the advantage of a changeable test type. Patients soon become familiar with the letters and read from memory rather than from an increased visual acuity. Usually there is no desire on their part to mislead, but much valuable time may be lost in this manner. Errors too are frequently made and incorrect lenses prescribed. Intelligent people easily memorize a certain line on the card while one eye is being examined, and they are enabled to read the same line with the other eye when it is tested although its acuteness of vision may be less than the first.

It has been my practice to have a number of cards so that each eye could be tested with different letters. Sometimes it is necessary, in order to make fine distinctions between lenses, to display different cards before the same eye. These changes involve loss of time and some trouble. As the changeable test type exhibited can be operated at the patient's side, it is done without any loss of time and has the additional advantage of not attracting the attention of patients to the fact that any change has been made. They are left to discover it by the sense of sight.

Children often try the patience of the examiner as much as do illiterate adults. Their curiosity prompts them to investigate the card before the examination is made, and

* Read before the Homeopathic Medical Society of the County of New York.

many succeed in memorizing the smaller letters. During the examination they make free use of the knowledge they have obtained. I have often noticed them reading the letters when their eyes were directed away from the card.

Some children are decidedly opposed to wearing glasses, and try to deceive the examiner in this manner. They fear the comments of their companions and the inconveniencies



of wearing the glasses. Others are wearied by the examination and repeat the letters they have memorized irrespective of the lens placed in the trial frame. When I suspect them, it is my custom to slip a convex lens in the trial frame which is strong enough to make it impossible to read the letters, yet they do read them and so expose themselves.

My plans of the test type were presented to Mr. Jos. Clairmont, who made the apparatus and perfected the motor for working it.

It consists of an ornamented wooden case upon which the letters, printed upon cardboard, can be displayed. The letters are so graded that the test may be made at all the usual distances from ten feet and upward, and do not themselves present any new features. The five lower lines only are capable of being changed, as this was thought sufficient to meet all the requirements. The change is produced by the revolution of five quadrangular rollers permitting the exhibition of four series of letters.

Motor power is furnished by an accordion pleated rubber tube which, when expanded by the column of air communicated to it by the pressure of a bulb, elevates a weight to which is attached an arm. As the arm moves upward it carries a cog which locks with the wheel which revolves the five rollers. This wheel contains four slots, placed at intervals of ninety degrees, for the reception of two catches, an upper and a lower one, which limit the revolution of the wheel to a quarter of a circle. After each quarter revolution the weight carries the arm back to its former position, setting the apparatus for the next change. It is operated by a bulb at the side of the patient, which is connected with the motor by rubber tubing.

FARADISM IN THE TREATMENT OF RHINITIS CATARRHALIS ATROPHICANS CHRONICA.*

BY J. B. GARRISON, M. D., NEW YORK.

There is probably no form of catarrhal disease more frequently demanding the attention of the physician, nor any that is more difficult to carry to a point of comparative cure, than that of the nasal fossæ when the atrophic stage has been fully developed. It is a condition which, in a large proportion of cases, seems to approach in an insidious manner, and by the time the discomfort to the patient has become sufficient to suggest the propriety of consulting a specialist, the condition is well seated.

It is a matter of extreme frequency to hear a patient say, on introducing his ailment, that he has come for examination fearing there may be some catarrh existing, he having for a month or two experienced some difficulty or annoyance regarding the nose, when upon the most cursory examination the atrophic condition is apparent.

A neglected "cold in the head," as it is termed by the laity, is productive, by the irritation, of an increased arterial supply, and hypertrophy ensues. The impeded nasal respiration, the pressure caused by the hypertrophic condition, after a time causes a diminished amount of nutrition to be sent to the parts, and atrophy is at hand. Inspection of the fossæ shows, instead of the normal pinkish-hued mucous membrane slightly moist in appearance, a whitish, glistening surface, tightly stretched over the

* Read before the first annual meeting of the National Society of Electro-Therapeutists held at New York City, September 28, 1893.

bones, and with more or less inspissated mucus adhering here and there.

The atrophic changes are more common in the respiratory tract than in the olfactory regions. Histologically there is simply a gradual atrophy or wasting away of the different layers of the mucous membrane, and the conversion of their elements into fibrous connective tissue.

Fortunately for our hopes in the method of cure proposed in this paper, the microscope shows no change in the nerve elements.

In health the air, in passing through the nasal cavities, should be well warmed by the arterial blood, which is distributed to the parts by the close plexiform network of arteries beneath and in the substance of the mucous membrane.

The nerves which supply the nasal fossæ are the olfactory, the nasal branch of the ophthalmic, filaments from the anterior dental branch of the superior maxillary, the Vidian, naso-palatine, descending anterior palatine, and sphenopalatine branches of Meckel's ganglion.

So we see it is well supplied by both the cerebro-spinal and sympathetic systems of nerves.

It is the object of this paper to urge upon the profession a thorough and persistent trial of the faradic current for the purpose of re-establishing a circulation in the parts, and to build new tissues by means of that pabulum the arterial blood only can supply.

The employment of massage in a proper manner, to parts of the body easily reached, is beneficial by the increased nutrition brought to the parts by the movements the operator produces.

The author remembers a case of catarrh which had long annoyed the gentleman in whom it existed, and which was completely cured after he had passed through a year's course of vocal training under a professor who required his pupils to practice the scales for two hours each day, using the syllable "ung" for each note, and protracting the sound

long enough to get distinct vibrations in the nasal cavities.*

This vibratory movement is obtained by means of the faradic current, and it seems rational to believe that the action of the electric current, in addition to the mechanical movement, must be of benefit in inducing nutritive changes.

Our plan of treatment is, first, to thoroughly cleanse the nasal cavity in the usual manner, and then introduce a flexible electrode about two inches long by one-half inch wide, which, being neatly covered with well moistened lint or cotton, is attached to one cord of the battery, the patient holding a sponge electrode in one hand. The secondary coil of long fine wire should be used, and the vibrations should be rapid.

Great care should be taken that the current be as mild as possible, only a slight sensation should be produced, and treatments should be given every day. The treatments should not exceed one minute in duration, at least for a considerable time.

I have not carried my investigations far enough yet to enable me to speak of cures; but in cases that I treated previous to my summer vacation, covering a period of about two months, and not more than three treatments per week, I was able to get a marked amelioration of the symptoms.

During the coming winter I shall hope to produce some results worthy of mention at a later date.

The treatment must be tedious at the best, and much patience will be required both by the doctor and the one to be treated, but I believe the result will justify the labor.

* My only authority for this statement is the gentleman himself, as I never had the opportunity of making an examination before or after the vocal practice alluded to.

ELECTRICITY'S FIELD IN OPHTHALMIC THERAPEUTICS.*

BY WILLIAM R. KING, M. D., WASHINGTON, D. C.

It is not my purpose or in my power to cover the above mentioned field, but merely to state some of my views thereon and relate a little of my experience.

During the past ten years, partially devoted to the application of electricity to the various ocular disorders, I have been met by ever increasing success, measured by the knowledge derived by experience in application.

Among the diseases and disorders thus treated, which affect the eye, and in many instances secondarily involve the general health, I would mention incipient cataract, corneal maculæ and leukoma, tarsal tumors, corneal ulcers, and the various forms of heterophoria or muscular insufficiency, as those wherein my experience has been chiefly obtained.

In my present state of mind I would greatly regret any possible deprivation of my battery when brought face to face with many cases embraced in the above category. Much has, doubtless, been done for the relief and cure of such ailments by other means, either therapeutic or operative, unassisted by the application of electricity in its selected form; but I feel that much success which I may claim has come from electricity used at least as an adjuvant.

My experience has been mainly with the galvanic and faradic currents of electricity; in fact, static electricity is as

* Read before National Society of Electro-Therapeutists, New York, September 28, 1893.

yet a closed book, so far as my personal experience in its practical application is concerned. In fact I can scarcely conceive of its beneficial use on the eye or its adjuncts.

Beginning with incipient cataract, we were always taught this was invariably the forerunner of a period of blindness, succeeded by an operation which always has varied in the degree of its successful outcome. I would here state that nine or ten years ago my ideas on this point received a severe shock by the accidental, partial absorption of the lenticular opacities and considerable restoration of vision in a case that had been doomed, by me, to await ripening and the knife. This, however, was accomplished by therapeutic means entirely, and was the subject of a paper by myself in one of our journals a few years ago. Following up this new (to me) idea I have during the past nine years treated a number of cases of incipient cataract in various stages of progression, by various methods and with varying results. It is the efficacy of electricity as applied to such treatment which I will here alone discuss. In numerous instances, during the treatment of this class of cases, I have found myself confronted by the fact that I was making little or no gain, in fact often losing ground; it was then I first turned to electricity for assistance, and I am convinced that in a number of cases it has greatly aided in retarding increase of opacity, and even in absorbing much already present in the lens cortex. It acts, seemingly, by first checking the cortical changes which result in the formation of opaque flecks and striæ, and later by stimulating absorption or effecting a readjustment of the molecules. Whatever the method of its action, I am convinced of its usefulness. Believe me, I have never had the hardihood to expect it to affect in any material degree a ripe or nearly ripe cataract. In fact I have little hope from it, even in the early stages of a true nuclear cataract. Permit me a brief report of one case :

Mrs. E. C. C., æt. forty-seven, widow, consulted me February 12, 1890, complaining of failing vision in left eye. Examination revealed an advancing cortical cataract—treatment advised—

other eye unaffected. V. O. S. = $\frac{5}{20}$, V. O. D. = normal. Remedies, iodoform 3x and causticum 6x, were given at different times with little, if any, effect. At last the galvanic current was applied directly to the eye globe, beginning with two or three milliampères and advancing gradually to eight or ten; this was immediately followed by an apparent reaction, and on June 30, 1890, just prior to a trip to Europe V. O. S. = $\frac{5}{12}$ fairly. I saw her no more until November 30, 1892, seventeen months later, when she called, complaining of general asthenopic symptoms and dimness of vision following a severe debilitating illness. O. D. V. = $\frac{5}{9}$, O. S. V. = $\frac{5}{15}$. The ophthalmoscope revealed a decided cloudiness of the lower and outer field of the pupillary area of the lens of the right eye, before unaffected—left eye in much the same condition as when last seen. The old experience guiding, I instituted immediate treatment with the galvanic current as before, together with tonic and stimulating remedies, and on July 3, 1893, V. O. D. = $\frac{5}{6}$ and V. O. S. = $\frac{5}{12}$.

In the treatment of macula corneæ, when not too dense or of too long standing, I am convinced that galvanism has aided me in obtaining improvement in vision in quite a number of instances. I have latterly applied it much the same as in cataract, after insufflation of calomel or the instillation of a solution of iodide of potassium 2 to 4 grains to the ounce; of course accompanied, where under my sole control, by the indicated constitutional treatment.

The proof of this assertion would appear to be in the fact that results are eminently better since employing galvanism as an adjunct in treating this class of tedious cases.

Tarsal tumors, usually of the cystic variety, have yielded, in several instances, to galvanism when the patient objected to operative interference.

By far the larger class of cases wherein I have successfully applied electricity is that extensive one covered by the title Heterophoria. It would be senseless for me to enter into any description of what constitutes heterophoria, especially in a paper read before this body of specialists; its significance is covered by the statement that it is essentially an insufficiency of some one or more of the ocular muscles

acting in opposition to a more powerful one, creating a loss of harmony in the movements of the pair of eyes which is so necessary to comfortable and efficient use of them in the normal effort of binocular vision. Given a special sense as important as that of sight, a sense normally dependent upon two organs acting harmoniously, and interfere with this natural harmony; what is the inevitable result? It is self-evident that discord and disaster, in some degree, must follow. In the aggravated and stubborn cases the extremely useful operative means are usually advisable. In a few of the simpler cases, rest, exercise, and the proper remedy will suffice. But there are a vast number of cases applying to the ophthalmologist for relief in which the latter measures are not sufficient to avail, and yet much can be done to avoid the necessity of the operation (often a species of patchwork) by means of electricity applied directly to the relaxed or weakened muscles.

Naturally my best results are obtained in exophoria, because of the fact that a muscle naturally more powerful than its opponent is being dealt with; consequently, when it responds to stimulation and exercise, it regains its normal tone more rapidly and completely. Much gratifying success has attended my efforts at restoring tone and power to the external recti—the muscles involved where esophoria exists. Low degrees of hyperphoria have quite frequently responded and have been entirely relieved. The higher degrees present conditions which, I believe, can be met by nothing but the partial tenotomy.

In exophoria, even of comparatively high degree, I firmly believe that electricity properly and persistently applied, together with systematic and vigorous prism exercises, will yield satisfactory results to both physician and patient.

My method of application is first to apply a galvanic current of from 5 to 20 milliampères, the negative pole over the belly and tendon of the muscle as far as possible, using a flat steel plate electrode protected by a thin layer of absorbent cotton, which I put on fresh for each patient, insuring cleanliness. This is followed immediately by a faradic current

graduated as far as can be borne; this, of course, varies greatly with different patients, owing doubtless to a varying degree of resistance in the animal organism. Each sitting occupies from five to fifteen minutes, and is repeated once, twice, or three times a week as seems wise and necessary.

In exophoria I am in the habit of adding to the electric treatment judicious daily exercise with suitable prisms, placed base out. It is true that this exercise alone will often relieve the trouble; it is also true that the application of electricity as above described decidedly hastens the result.

In esophoria, also, I occasionally invoke the aid of prisms for exercise purposes, but with less return for my invocation.

In hyperphoria assistance has undoubtedly been derived from weak compensating prisms worn during the treatment; but with these mechanical and optical aids I must class electricity as among the most useful means for affording relief to those suffering from the results of lack of ocular harmony; always bearing in mind that there are cases wherein the resort to anything but the operation is purely loss of time and of opportunity.

I have said nothing of the galvano-cautery, or of electrolysis in its application to ocular disorders. Its field here is not large, so far as my experience has extended. Corneal ulcers have been greatly benefited, and the integrity of the eye retained, in several cases, I am convinced, by the application of the galvano-cautery to its base prior to the threatened puncture. This class of disease of the cornea offers a decidedly useful field for the cautery.

Pingueculæ and pterygium have been removed by this method, though I have no experience here to record.

In a case of persistent dacryo-cystitis good results followed the application of a cherry red point to the sac, destroying infecting tissue and secretions. This is my sole experience in this direction.

The galvano-cautery has simply the same general surgical application to eye diseases that it has to troubles elsewhere, modified by difference in locality and tissue involved.

Doubtless electricity has been applied, by some of my colleagues, to other ocular diseases or disorders than those mentioned here. If so, I shall be most happy if the discussion of this crude paper may serve to bring them out, that their full experience may become the property of the society.

REMOTE CAUSES OF PHARYNGEAL CATARRH.

BY C. GURNEE FELLOWS, A. M., M. D., CHICAGO.

In the January number of this journal William Dulany Thomas, M. D., of Baltimore, gave us a well written article upon "Dyspepsia as an Underlying Cause of Naso-Pharyngeal Catarrh," and having been making some investigations along the same lines, I offer this article as supplementary to the one above mentioned. Bosworth, Seiler, Proctor Hutchinson, Lenox Browne, Cohen, McBride, etc., all admit that diseases of the digestive apparatus are at work in the production of some of the pharyngeal diseases. But that these causes extend all the way from the oro-pharynx to the rectum is not so generally noted.

That the liver is a cause of nasal disease is a fact which is not so readily admitted, but that this can be proven I will try to show, as well as that intestinal catarrhs and rectal diseases play an important rôle in the causation of pharyngeal disease.

Laning* has proven the intimate relationship which exists between the liver and the nose. "This connection is largely through the vasomotor fibers of the sympathetic system. If the hepatic circulation be for any length of time deranged in a certain manner, the nose indicates it. The vasomotor filaments which control the nasal circulation are thrown into a paretic state, the capillaries become distended and relaxed, and as a result the nose becomes red, hyperæmic; in short it represents the condition of the liver so far as its vascularity is concerned. . . . When there is partial

* *Clinique*, vol. viii. p. 254.

stasis or hyperæmia the nasal mucous membrane is very liable to be affected in a similar manner, *i. e.*, the veins distributed to that membrane are relaxed, and the current of blood passes through them tardily. As a result there occurs what takes place in any mucous membrane in which the circulation has become deranged, *viz.*, abnormal secretion."

Arnulphy* has observed for a number of years this intimate relation between nasal and hepatic disease. He publishes a number of cases sustaining his theory.

The symptoms which are common to all are "pain at the root of the nose," "nose stuffed up with dry scabs,"—or "feeling of stuffiness,"—bad taste and foul breath, and nasal hemorrhage, which is often followed by a relief of symptoms.

The dry catarrh is simply a passing annoyance, and is not to be confounded with atrophic rhinitis.

Most of the text-books, speaking of the subject of chronic granular pharyngitis, refer casually to digestive disturbances as a factor in their causation, but I have not seen any discussion calling special attention to intestinal and particularly to rectal causes.

Dr. Thomas has explained how dyspepsia is an underlying cause of naso-pharyngeal catarrh. And, it being a general term, may possibly include the diseases of the lower intestinal tract, at least so far as the rationale is concerned.

The persistency with which pharyngitis granulosa and pharyngitis lateralis return is fair evidence that they are more than local diseases.

It is commonly accepted that constipation is often an accompaniment of chronic pharyngitis; but that the underlying cause of the latter is also the cause of the former has not been sufficiently noted.

The constitutional disturbances dependent upon rectal irritation have been sufficiently discussed by enthusiasts of the orificial school, and need no separate discussion.

The effect that dilatation of the rectal sphincters has upon the respiration is well known; the commonly recognized

* *Chnique*, vol. viii. p. 434.

symptom of "worms" (rectal irritation?) picking at the nose, and the many published cases of reflex ocular symptoms * due to rectal troubles, only show by comparison how the same causes, under other circumstances, may show themselves in varying reflex symptoms.

But when we consider that the oro-pharynx is part of the intestinal tract, the correlation of symptoms is easily accepted.

The naso-pharynx, however, belongs to the respiratory tract. Yet diseases of the one often run into those of the other.

Granting that the cure of dyspepsia will assist in the cure of chronic pharyngeal inflammation, it would follow as surely that the removal of any intestinal irritation might produce the same result, as it, in turn, underlies the dyspepsia.

If acute pharyngeal troubles are often due to stomachic causes, it is also true that chronic pharyngeal troubles are often due to diseases of the lower bowel.

I believe that the causes are both direct and reflex. Direct in that mal-assimilation and indigestion go together, and the anatomical connection is sufficient to prove the relation; reflex in that the sympathetic system is disturbed, as in the case of hepatic causes.

I have had several cases which could be cited as illustrations. Some of them have been temporarily benefited by the ordinary methods of treatment, but with a recurrence from time to time.

Upon close investigation acute hemorrhoidal inflammation, constipation, enteritis, etc., were found to be the underlying causes. One case had been in the hands of several physicians, with apparently good results at first, but with frequent relapses.

An unsuspected fissure in the rectum being discovered and healed, the treatment of the throat produced permanently good results.

I do not claim that all pharyngeal symptoms may be traced to intestinal causes, but, by calling attention to remote constitutional causes of local symptoms, hope to show the need of continual vigilance on the part of specialists: that the whole of the disease be seen and not a part only, that the totality of the symptoms be ascertained before we prescribe treatment, whether it be medical or surgical.

* McDermott, "Transactions of the American Institute of Homeopathy," 1890.

A FEW TRIED REMEDIES IN THE TREATMENT OF NASAL CATARRH.

BY WM. DULANY THOMAS, M. D., BALTIMORE, MD.

My purpose in presenting the subject indicated by the above title is not with the view of offering anything new, but simply to give a synopsis of a few remedies which have been proved, by me, to be efficacious in the treatment of chronic nasal and post-nasal catarrh, and the symptoms consequent thereupon.

It will doubtless be conceded as a fact that in the treatment of chronic diseases many remedies are prescribed, but few are of any special benefit to the patient. And this is particularly true of nasal catarrh. We have constantly brought to our attention liquid preparations for local applications, which are accompanied by confident statements as to their value, when in reality they are nearly worthless. I do not desire to be understood as regarding local applications to be of little service; upon the contrary, I greatly esteem them, and use them freely in the cases where indicated. The object of this paper is not, however to speak of local applications, but to recommend a few remedies for internal administration; and I trust that they may prove to be of service to the general practitioner, since for him is this tabulated list prepared—it is assumed that the specialist has already become familiar with them.

Alumina.—In atrophic catarrh, or when there is great dryness of the mucous membrane of the nose and throat. Is better indicated when accompanied by obstinate constipation.

Arsenicum album.—Thin, acrid discharge, excoriating the nose externally; burning sensation in the nose and throat; desire to drink frequently; to be thought of in cases where there has been long exposure to malarial influences.

Baryta carb.—Hypertrophied tonsils; children who breathe with their mouths open, especially while sleeping, and who jump and start during repose at night. While I have never known this remedy to very materially decrease the size of an hypertrophied tonsil, I am quite sure it will often relieve the annoying symptoms consequent thereupon.

Belladonna.—In the dry, tickling cough of children—especially those having hypertrophied tonsils—and which is worse at night upon lying down; persistent dry sore throat.

Calcarea carb.—Nasal polypi; this remedy has proved curative in my hands in the 3x trituration. It is, I believe, however, more useful in congestive states of the nasal mucous membrane than where there is positive new formation.

Gelsemium.—Relaxed condition of the throat; muscles refuse to act co-ordinately; difficulty in swallowing; hoarseness.

Graphites.—Very serviceable in nasal catarrh accompanied by sore nostrils, externally and internally swollen cervical glands; disorders of menstruation.

Hydrastis.—Particularly indicated where there is a dropping of mucus into the throat from the posterior nares; of far more service when the above symptoms are accompanied by an *all-gone* sensation in the epigastrium; a sluggish liver and constipation.

Kali bichrom.—Tough, stringy, ropy discharge; tendency to ulceration of septum nasi. The first improvement noted through the use of this drug is a lessening in the viscosity of the mucus—the patient soon remarking that the secretion is more profuse than ever. Kali bi. is a general remedy, and is useful in the majority of the cases of nasal or post-nasal catarrh. It must be used in the 3x trit.

Lachesis.—Sharp, neuralgia-like pains in the throat; sensation of a lump in the throat, relieved by eating; patient complains more of the throat than the local manifestations of the trouble justify.

Merc. sol.—Syphilitic pharyngitis; ulcerations. This remedy, for this purpose, I use in the 1x trit. and find it very effective.

Nitric acid.—Sensation of splinters in the throat; tight, stiff feeling high up in region of pharyngeal tonsil; yellowish-green mucus.

Nux vomica.—Cephalalgia across forehead—a prominent symptom in nasal catarrh; dyspepsia; constipation; heaviness across bridge of nose.

Pulsatilla.—Yellowish-green, non-excoriating discharge; timid, yielding disposition; inclination to weep; dyspeptic symptoms of the drug—best administered in tincture.

Sanguinaria.—Thin discharge from nostrils, with frequent sneezing; polypus. This drug is often useful when the above symptoms are present without the presence of polypus.

Wyethia hel.—While I know of no proving of this drug, it is, nevertheless, a good general remedy in nasal and post-nasal catarrh. My experience, however, has only been in the treatment of post-nasal disease; and I find it indicated when granulations are present in the pharynx with the usual symptoms of post-nasal catarrh. I use it generally in the 1x dil.

While the above remedies do not include a complete symptomatology, so far as the action upon the particular parts is concerned, they do represent such guiding symptoms as I trust will be of service to those for whom they are intended. It has been my purpose to include only such symptoms as are practical and to the point. It will be observed that no mention has been made of local applications. While I think these of the utmost importance in some cases, the intention of this paper has been fulfilled in speaking of the therapeutical application only.

HYPERTROPHIC RHINITIS.*

BY IRVING TOWNSEND, M. D., NEW YORK CITY.

Although the subject which I present to you may seem trite, there is no form of nasal trouble so frequently met with in general practice, or that is more amenable to proper treatment, than hypertrophic rhinitis. It is also true that no form of nasal disease as frequently gives rise to serious sequelæ, if neglected.

Regarding the ætiology of this affection authorities are not in accord. Thus Bosworth claims that deformities of the septum by the irritation resulting therefrom is the most common cause; while such causes as the inhalation of air laden with dust or gases, the use of irritating snuffs, sudden atmospheric changes, constitutional conditions—as the so-called catarrhal diatheses—and frequent colds are not entitled to much consideration as ætiological factors. The consensus of opinion among the authorities, however, as well as a limited personal observation, leads me to conclude that each of the foregoing causes is likely to figure either as a predisposing or exciting cause in many cases. That frequent attacks of acute rhinitis may, as suggested by Bosworth, result from, rather than produce, the hypertrophic conditions is undoubtedly true; but that each attack, causing as it does an increased supply of blood to the part and a partial stasis with consequent over-nutrition, favors the hypertrophic process, I believe to be equally true. Again, unhygienic living, overheated houses and personal uncleanness are undoubtedly conditions that favor its development.

* Read at a Meeting of the Meissen Club, January 20, 1893.

The pathological changes presented may be briefly stated as follows : an increased growth of the three layers of the mucous membrane, blood stasis, increase of connective tissue in second and third layers, dilatation of veins in submucous layer, with hypertrophy of the intervenous connective tissue. Thus it will be seen that each layer takes part in the hypertrophic process, and the size and consistency of the growth and the character of the secretion will depend, to a considerable extent, on the layer most involved ; the extensive swellings occasionally seen over the turbinates, and particularly about their extremities, being a real myxomatous degeneration presenting the appearance of a polyp, and may often be mistaken for such. Generally, however, the third layer is responsible for the greater amount of swelling, it being due to the engorgement and dilatation of the veins ; its firmness and density depending on the degree of connective tissue increase.

The symptom that is most prominent, and the one that usually leads the patient to seek medical advice, is the stenosis and resulting interference with nasal respiration. Following in its train we find a variety of symptoms that are quite characteristic. Instead of the normal mucoserous secretion in the nose, we find a condition of dryness, the secretion thicker and more tenacious, and expelled with some difficulty ; the mouth partially open, the lower jaw depressed, a dull apathetic expression of the face, marking the "mouth breather." The mental development of children is unquestionably retarded where this condition is present, though it is not easy to see the reason therefor ; but they often show surprising improvement intellectually after nasal respiration is restored.

Laryngitis and granular pharynx are common sequelæ of mouth breathing, and snoring at night is frequently observed. Where predisposition or environment favors, it is quite probable that the habit may become the exciting cause in the development of pulmonary phthisis. The inspired air laden with dust and impurities, and deprived of the moisture and the filtration process exercised by the

ciliated epithelium of the nasal cavity, cannot fail to act as an irritant to the delicate lining of the lower air passages. Post-nasal dropping of mucus, and the hawking and scraping in the effort to dislodge it, are common symptoms. Anosmia, as well as a very considerable impairment of the sense of taste, is not an infrequent concomitant of this condition. Catarrh of the middle ear, catarrhal conjunctivitis, and inflammation and occlusion of the lachrymal duct may also be traced to this cause.

The changes in the voice, giving it the so-called nasal intonation, are well known. This is always disagreeable: and to those whose vocation requires a clear as well as accurate use of the voice, as singers and public speakers, etc., it becomes a matter of great importance. The prevalence of this trouble in this country, and particularly along the Atlantic seaboard, has given rise to the belief among foreigners that it is an Americanism or species of affectation.

Dull frontal headache and neuralgia, as well as catarrhal and even suppurative diseases of the antrum, may be caused by the alternate rarefaction and compression of the air during respiration.

In addition to the above, there is another class of symptoms or diseases referable to distant organs, induced reflexly by pressure and irritation within the nasal cavity. Cases of asthma, chorea, epilepsy, reflex spasmodic cough, neuralgias, neurasthenia, spasm of the glottis, hay fever, migraine, enuresis, and salivation are occasionally dependent on intra-nasal hypertrophy; and a restoration of the function of the nose, where such is the case, results usually in prompt relief.

By careful inspection with good illumination we are able, in nearly all cases, to appreciate even the lesser degrees of hypertrophy; the color of the membrane is a dull red or reddish gray, midway between the bright red of acute inflammation and the bluish hue of venous engorgement; generally showing a thin covering of tenacious grayish secretion. A greater or less amount of swelling of the inferior and middle turbinates with a smooth cushiony

look, or in, some cases, a slightly corrugated or rugous appearance, is observed. Just here it is important to distinguish between the proportion of real hypertrophy and the swelling due to venous engorgement, and also to differentiate hypertrophy from the swelling occasioned by acute inflammation or vasomotor disturbance. The resiliency of the swelling, as shown by the rapidity with which it resumes its former outline, after pressure made with a ring probe, will indicate the amount of real hypertrophy; in which the reaction will be prompt, owing to the elasticity of the connective tissue formation, whereas it will take place more gradually if due to dilatation of the veins or to acute inflammation. The color, as above noted, will assist materially in the differentiation. If any doubt exists, a spray of a four per cent. solution of cocaine will quickly reduce any swelling due to congestion or venous engorgement; and if no hypertrophy exists the outline of the turbinated bones will be seen through the blanched mucous membrane covering them. Where nasal obstruction exists, and inspection of the anterior nasal fossæ fails to reveal the cause, it can usually be discovered by the rhinoscope and in children will be found, in a large majority of cases, to be an overgrowth of Luschka's tonsil; and in adults, either a polypus located far back, or an hypertrophy of the posterior end of the inferior or middle turbinates. When found in this location, the growth generally assumes a rugous or raspberrylike appearance, and is paler in color. A valuable means of ascertaining the exact location, conformation, and attachments of growths situated posteriorly, and one that I always employ before operating, is to pass a thin probe, armed with a very small pledget of cotton (the mucous membrane having been previously cocainized), back through the inferior meatus, examining the lower surface of the inferior turbinate and the corresponding surface of the septum; afterward exploring the middle meatus in a similar manner. An exact appreciation of the size and shape of the hypertrophied mass can only be obtained in this way.

The treatment of these cases should be, I believe, primarily operative, the indications being, first, to remove enough of the hypertrophied tissue to permit free nasal respiration; second, to restore as far as possible the function of the diseased membrane; third, to prevent recurrence. Various escharotics, such as nitric, glacial acetic, and chromic acids, have been advised in the lesser degrees of hypertrophy, and a large number of instruments has been devised for the removal of growths of larger size; but I will not burden you with their enumeration. In the majority of cases where the stenosis is not complete, and where the turbinated bones themselves are not much enlarged, chromic acid fused on a probe, or the saturated solution, may be applied to the apex of the swelling; first, applying a four per cent. solution of cocaine in which is dissolved 20 minims to the ounce of carbolic acid; then, carefully wiping off, with dry cotton, all secretion and moisture, and after two or three minutes apply the acid as above. It is important to dry the membrane before applying the acid, as you can then limit the extent of surface cauterized. There is very little pain at the time; the day following there may be a little stuffiness, but by the second or third day considerable relief is experienced. Several applications may be required. Where there is very considerable hypertrophy, or where the density shows an overgrowth of connective tissue, the galvano-cautery knife is more efficacious. It should be passed in cold, the connection made, and the electrode made to burn down to the bone. As the scar contracts and draws down the tissue on either side of the linear cut one application is frequently enough; and as the mucous membrane of the nose is readily re-formed its function is little if at all impaired thereby.

Where the turbinated bones themselves take part in the hypertrophic process, my choice of methods lies between the snare of Sajous, the cutting forceps, and the saw; sometimes one, sometimes the other, according to the situation, size, and shape of the mass to be removed. In the myxomatous hypertrophy affecting usually the anterior

aspect of the middle turbinates, or in posterior growths, which are apt to be somewhat pedunculated, the cold wire snare can be used to advantage; and if sufficient time be taken in constricting the growth, there is little danger of hemorrhage. The cutting forceps are well adapted to the removal of fibrous or cartilaginous growths, but can seldom be used to advantage in bony formations; the saw or the snare being the better instrument in these cases.

Before all operations on the nose it should be carefully cleansed by an alkaline solution, as bicarbonate of soda or sodium chloride, and sprayed with a 1-4000 solution of corrosive sublimate; and after operation, if there be much bleeding, I usually pack the nose for twelve to twenty-four hours with cottonade or lintine, saturated with bichloride solution.

As a means of fulfilling the second indication, we should cleanse the nose by post-nasal syringe, two or three times weekly, and have the patient use a spray, twice daily, containing a solution of menthol and phenol, of each 5 grains to the ounce of benzoinol. If the irritability be great, I sometimes add 5 grains of cocaine to the ounce of this solution. This spray is usually very grateful to the patient; occasionally, however, no relief is experienced, and they complain that it increases the sense of fullness. Where this is the case I should prescribe white vaseline or albolene ointment (plain), to be applied with a camel's hair brush. Insufflation of powders I believe to be bad practice. Though they give temporary relief by exciting serous transudation, it is more than offset by damage done by the particles remaining in the nose and becoming new foci of irritation.

Preventive treatment is of great importance, lying in the direction of hygienic living, regular bathing, and daily exercise in the open air as well as proper diet and attention to the condition of the digestion; in short, all those things that serve to increase the vitality of the individual and prevent the susceptibility to colds.

From the use of remedies I have never observed any decided action in reducing true hypertrophic tissue. It is, however, very important that underlying constitutional conditions be appreciated; and the carefully selected remedy will do much in the line of prevention, by restoring the general health of the individual.

REPORT ON THE OPHTHALMOPLEGIAS.*

BY DR. H. ARMAIGNAC, BORDEAUX, FRANCE.

Normal vision, that is binocular, is accomplished by means of muscular contractions, either synergic or antagonistic; if we look to the right or to the left, the external rectus of one side contracts in harmony with the internal rectus of the opposite side; if we converge to view a near object, the internal recti contract; if, on the contrary, we look at a distance after fixing a near object, the external recti enter into play. In looking upward or downward the superior recti or the inferior recti contract, but not alone; for, in looking upward or downward, according as the fixation is divergent or convergent, or as it is directed to the right or to the left, we are obliged to contract simultaneously various groups of muscles of which the definitive and associated action will produce the desired inclination of the visual axes.

From this simple explanation will be seen the complications of which the associated contractions of the oculomotor muscles are capable, and we cannot help but admire the perfect order which presides over such diverse movements in order to produce clear vision in all parts of the field of vision.

The order of association of these muscular contractions is so fixed, so determined, that we cannot, save very rare exceptions, contract separately the muscles which habitually contract together.

That which I have said relates only to the different direc-

* Presented at the tenth session of the Société Française D'Ophthalmologie, Paris, 1892.

tions taken by fixation in relation to the different points of the visual field; but there is yet another variety of association of muscular contractions which no less merits attention; when we look at a near object and when, in consequence, the two internal recti are contracted, there occurs at the same time a contraction of the pupillary sphincter of the accommodative muscle, both innervated by the third pair of nerves. Finally, in looking upward, the upper eyelid is uplifted by the action of the levator, also innervated by the third pair.

The four rectus muscles and the two oblique bear the name of external or *extrinsic* muscles; the two muscles of the pupillary sphincter and of the accommodation are designated as internal or *intrinsic* muscles.

A strange peculiarity, but one of importance, is that only the superior oblique and the external rectus possess a cranial nerve distinct from its origin to its termination, while the superior, internal, and inferior recti, the inferior oblique, the ciliary muscle, and the pupillary sphincter receive only a branch from the common oculo-motor nerve.

However, it is impossible to follow the motor branch that the third nerve furnishes to the ophthalmic ganglion beyond this ganglion; and it is only by induction, and by a basis of physiological experiments and clinical observations, that we admit that the branches which are supplied to the ciliary muscle and to the pupillary sphincter are the continuation of the motor root of the ophthalmic ganglion.

The common oculo-motor nerve, by virtue of the variety and the multiplicity of its branches, is therefore the one which presents the greatest interest in a clinical and physiological point of view.

As we have created the terms *hemiplegia* and *paraplegia* to designate total paralysis of *half* of the body or of both *lower limbs*, reserving the term paralysis to indicate loss of movement of a single limb, so in like manner we have created the term *ophthalmoplegia* to designate total, or almost total, paralysis of the muscles of one eye or of both.

It was Brunner first, then Graefe and Eulenberg, who employed this expression to indicate certain complicated paralyses of the oculo-motor muscles. In 1878 Hutchinson resuscitated the word ophthalmoplegia, until then somewhat forgotten, and, in a communication to the Medical and Chirurgical Society of London, he even proposed to subdivide the disease into *internal* and *external*, according to the muscles attacked. The following year, Hirschberg likewise employed the term ophthalmoplegia in a *résumé* of observations.

It will appear, from what I say, that the expression ophthalmoplegia would be characteristic of a state of the muscles of the eye, or of both eyes, analogous to that of all of one-half of the body or of both lower limbs. But some of the best authorities do not agree in this, and Mauthner, for example, to whom we owe the greatest work on this subject, says: "We have ophthalmoplegia whenever two or more muscles innervated by different nerves are attacked by paralysis, whether these muscles belong or not to the same eye. We have an isolated paralysis, on the contrary, when a single nerve is attacked on a single side." If it is the third pair, whether a single muscle or whether the seven muscles innervated by this nerve be paralyzed, we would have, according to Mauthner, only an isolated paralysis and not an ophthalmoplegia. To me, this manner of looking at things does not appear to conform to the terminology which should be the rule as much in ophthalmology as in general medicine, and for this reason I do not believe it should be adopted.

In fact, although the common oculo-motor nerve has only one trunk, anatomically speaking, is it logical to consider it as a single nerve? I do not think so. The frequency of the isolated paralyses which so often attack each one of the muscles supplied by the third pair, to the exclusion of all the others, would seem to indicate that this nerve trunk is only a bundle of several independent nerves, each supplying a distinct muscle. From this we could say, if we preserve Mauthner's classification, that there occurs an ophthalmo-

plegia whenever any two muscles are paralyzed, whether or no these muscles belong to the same eye.

But, in this case, the term ophthalmoplegia has no more than a character of artificial classification, and does not correspond to any clinical, anatomical, or physiological idea. Authors who have copied Mauthner, and adopted his ideas with more or less enthusiasm, should have recognized that this author has opened a false route, and that he has misled science in place of illuminating this question.

Should we, then, in adopting Mauthner's classification, attribute to the term ophthalmoplegia a meaning different from that of paralysis? I do not think so, and, in spite of the authority of this celebrated ophthalmologist, it is impossible to admit his view. It does not differentiate ophthalmoplegia, clinically and physiologically, from other paralyzes of the ocular muscles.

At the risk of passing for a revolutionist, I shall propose, then, if we admit Mauthner's classification, to make the terms ophthalmoplegia and paralysis two synonymous terms, while insisting on the particular clinical characters which may be presented by paralyzes which extend to a more or less complicated group of ocular muscles.

In fact, what characteristic peculiarity, in a symptomatic or anatomico-pathologic point of view, has a paralysis of two muscles animated by different nerves? Will the disease be different because a tumor at the base of the cranium, for example, compresses the common oculo-motor nerve alone, or at the same time involves the external oculo-motor or the patheticus, or all these at once? or again, because a hemorrhage of the floor of the fourth ventricle has destroyed one or several nuclei of the third pair of one side or of both sides at once, where these nuclei are separated by a space of only a few millimeters or even touch?

If we gave the term ophthalmoplegia to paralysis of intracerebral origin, and reserved the term paralysis for those which relate to a lesion of the base of the cranium or of the orbit, the distinction would have the advantage of being based on an anatomical reason. If, again, we re-

served the term ophthalmoplegia for the paralyses which attack all the motor muscles of one eye, or of both eyes at once, or the greater part of these muscles, it is true we would obey a solely symptomatic classification, but it would be one offering nothing particularly pathognomonic in view of localization or of the cause of the disease which produced the paralysis. Ophthalmoplegia, then, far from constituting a determined morbid entity, is simply confined to some particular objective characters.

Is there place, according to this, to establish so great a difference between ophthalmoplegias and paralyses, since both may present identical or diverse conditions with relation to the seat and the nature of the lesion, and since they only differ by some objective or functional symptoms?

For this reason, in the present work, I shall take the term ophthalmoplegia as synonymous with paralysis, although I shall be careful to note the differences which may exist, in view of the objective aspect, of the diagnosis of localization and of the nature of the lesion, between the paralyses which attack a single muscle and those which attack several.

To study, we must divide; thus I first thought to divide the study of the ophthalmoplegias into four chapters:

(1.) Varieties; (2.) diagnosis and symptomatology; (3.) ætiology and pathological anatomy; (4.) prognosis and treatment; but I saw at once that this division was too general, and that it would produce a great confusion on account of the repetitions to which it would give rise; each of these varieties, for example, having its special diagnosis, its symptomatology, its own lesions, its prognosis, and its treatment.

I have, then, been obliged to renounce this and to adopt a division based on the anatomical seat of the primitive lesion. This division obliges me to describe in special manner each of these varieties, but this will afford greater clearness than an exposition of generalities.

If I wished to enumerate all the forms that ophthalmoplegia may take, it would be necessary to make a fastidious

and certainly useless classification. From the moment that I have admitted, and this is scientifically demonstrated, that all the muscles of the eye may be paralyzed isolately or in groups, either in one eye or in both eyes, it is implicitly understood that each of these paralyses has its own characters.

It appears necessary, however, for the clearness of the subject to simply enumerate to you the great divisions admitted for the ocular paralyses.

These divisions are *general* or *special*.

a. General.—Ophthalmoplegia is *congenital* or *acquired*; *acute* or *chronic*; *stationary* or *progressive* or *intermittent*.

b. Special.—Ophthalmoplegia is *internal* or *external* or *mixed*; *unilateral* or *bilateral*; *partial* or *total*; *simple* or *complicated*.

Each of the divisions may, in its turn, be subdivided into a more or less considerable number of species and varieties, but these generalities present only a relative interest and I shall not delay for them. The great general divisions alone appear worth preservation, for they furnish the qualificative terms which give to the disease its entity and its true importance. If I say, for example, that an ophthalmoplegia is congenital and stationary, I give it a special clinical character and a particular physiognomy; if I say it is traumatic I also indicate a quality well marked and independent of its particular characters, relative to its extent and to the diverse modalities of its existence.

To diagnosticate a disease, it is especially necessary to study the symptoms, while avoiding the error of falling into the commonplace manner employed in manuals or treatises on ophthalmology that are obliged to devote a special chapter to each of the paralyses of the oculo-motor nerves.

Paralysis of an ocular muscle may manifest itself in two ways: 1. By abolition of all contraction and, in consequence of any action of this muscle, the antagonistic muscle preserving its integrity. 2. By the abolition of all contraction of the paralyzed muscle, but with contracture or retraction of the antagonistic muscle. We may even mistake, at first

sight, a contracture of a muscle for a paralysis of the antagonist, as in hysteria, for example.

Another phenomenon which always accompanies acute paralysis, but which is generally wanting in congenital or chronic paralysis, is the *diplopia*. However, diplopia may not be constant in other cases and only manifest in certain positions of fixation. In fact, in spite of the paralysis of a muscle, whether this muscle be or be not supplemented by one or several others, the eye remains in what we call the primary position in distant vision, but in fixing a near object the strabismus and the diplopia appear.

If the adductor or abductor muscles be paralyzed on both sides at once, there will be observed this singular phenomenon of divergence or of constant divergence of the visual axes, so that the patient squints simultaneously with both eyes. It is evident that this is possible only in paralytic strabismus and differentiates this form from concomitant strabismus in which one eye always fixes.

The description of the various muscular paralyses, as I have said, cannot find place here ; however, when the paralysis attacks several muscles, it is very necessary to use care in the examination of the different movements of each eye in the particular and also the associated motions.

In fact, we know that there exists a variety of paralysis designated under the name of *conjugate* paralysis or deviation, of which the first complete description was given by Prévost, in his thesis of 1868, and which has since been studied by Landouzy (1876) and Grasset (1879) ; but this paralysis only interests us in a physiological point of view, for it never exists alone and is always accompanied either by paralysis or convulsions of one side of the body or face or by permanent rotation of the head.* I shall have occasion to return to this in relation to localization, to the motor centers of the different muscles of the eye.

* Grasset. *De la Déviation Conjugée de la Tête et des Yeux*. (Communication à l'Académie de Montpellier, séance du 5 Mai, 1879.)

(To be continued.)

BOOK REVIEWS.

SYSTEM OF DISEASES OF THE EAR, NOSE, AND THROAT. Edited by CHAS. H. BURNETT, A. M., M. D., Vol. I. Illustrated. Philadelphia: J. B. Lippincott Co. 1893.

This handsome volume of 789 pages is the first part of what is intended as a comprehensive work on the subjects treated, in which for the first time these organs, so intimately related in function, are brought together in a treatise under one cover. Each subdivision of the work, of which there are twenty-three, is written by a practitioner who is specially fitted for the presentation of his subject, and many of them have a world-wide fame in connection with the branches assigned to them. In the portion of the work devoted to the ear, the names of Burnett, Clarence J. Blake, Gorham Bacon, Dench, Sexton, Spear, and Sir William Bartlett Dalby are prominent, while Carl Seiler, Clinton Wagner, Bosworth, and others make up the nose and throat staff. An effort has been made to give in detail, all that is known respecting the subjects treated, consisting, as stated in the Preface, of the practical conclusions arrived at by the authors and other investigators, rather than the discussion of theories. The first 98 pages are devoted to a full and excellent description of the anatomy and physiology of the ear, which is freely illustrated by cuts, and is followed by divisions devoted to the various forms of disease as usually found in text-books, in which is included a chapter on the Middle Ear in Renal, Malarial, Syphilitic, Gouty, Rheumatic, and Dental diseases, and another upon Ocular Lesions in Aural Diseases and Coincident Ocular and Aural Disorder in Systemic Disturbances, the latter by Charles A. Oliver and Arthur H. Cleveland of Philadelphia.

Part II, which is devoted to the nose and naso-pharynx, opens with the anatomy of these parts, and among other things con-

tains a description of local therapeutics in diseases of the nose, naso-pharynx, and larynx by Clinton Wagner ; the necessary instruments being shown by cuts, and, in addition, two plates are given showing the arrangement of the examining and inhalation rooms of the Metropolitan Throat Hospital of this city ; there is also an essay on influenza and American grippe under the caption Chronic Catarrh of the Middle Ear. While the description of the disease is excellent, it would seem as if the author, Dr. Sexton, in giving directions for treatment, had confined himself, perhaps, too closely to his own method of operation in this affection at the expense of other remedial measures ; we miss both here and under "Objective Noises" any notice of the various instruments for effecting aural massage, which has certainly given relief in numerous cases, and which in the case of tinnitus certainly offers us the most scientific and reasonable method of treatment. The mastoid operation is treated at length and in an excellent manner ; the steps of the operation and the instruments necessary being carefully described in detail, so that nothing is left to the imagination or supposed knowledge of the reader, which is not always the case in our text-books.

In the article on osseous growths in the external auditory canal, the author, Sir Wm. Bartlett Dalby, recommends the dental engine and drills for removing the superfluous bone, and deprecates the use of the mallet and chisel. In this we cordially agree with him, and would add that the same instrument can be used with equal facility and much time can be saved thereby, in the mastoid operation ; the small wound required, the lightness of touch, absence of concussion, and the ease and rapidity of operation possible when this machine is used being factors of no small moment. We should be glad to see more care exercised in the recommendation of solutions of cocaine for use in operations on the nose and throat ; the drug is advised in solutions of from four to ten per cent., and nothing is said about the possible danger from cardiac depression or secondary hemorrhage, although it is well known to those who operate upon these parts frequently, that these dangers are real and sometimes formidable, and it would seem that these facts should be stated in works relating to the subject.

Although it cannot be said that there is very much that is new in this work, the fact that the subjects are considered at length,

and in detail makes it valuable and will give it a welcome in the library of the well-read physician. The volume contains a large number of woodcuts and several colored plates.

DISEASES OF THE EYE. A Practical Treatise for Students of Ophthalmology. By GEORGE A. BERRY, M. D., F. R. C. S. Ed. Ophthalmic Surgeon Edinburgh Royal Dispensary, Lecturer on Ophthalmology Royal College of Surgeons, Edinburgh. Second Edition, revised and enlarged, with colored illustrations from original drawings. In one octavo volume of 745 pages with 197 illustrations, 87 of which are beautifully colored. Cloth \$8. Philadelphia : Lea Bros. & Co., 1893.

It is a pleasure to see a new edition of this most excellent treatise. The new volume has been enlarged to 745 pages as against 680 in the first edition. The additional space is given particularly to the examination of the eye, to amblyopia and amaurosis, and especially to affections of the muscles, which occupy 68 pages in the new against 50 pages in the old work. The number of illustrations has been increased from 144 to 197, and of this addition no less than 35 are colored plates. It is worthy of remark that the colored plates in this work are probably the finest that have ever been published outside of an expensive atlas, and we question if they have been surpassed anywhere.

We note the consideration of electric light conjunctivitis and hyperplastic conjunctivitis as new to this work ; the chapter on color blindness has also been lengthened and elaborated. As a general statement, the book has been brought up to date. Under cataract operations, the author declares against the simple operation. He considers that the advantage of a round pupil, either for cosmetic or visual effect, is trifling in comparison with the risk of entanglement of the iris—in his own words, “the game is not worth the candle”—and in this we agree with him. Those who have read the first edition will not need to be advised to purchase the second ; to all others we would say that it is indispensable to the library of the progressive physician.

A MANUAL OF DISEASES OF THE EAR. By GEORGE P. FIELD, M. R. C. S., Aural Surgeon and Lecturer on Aural Surgery, St. Mary's Hospital Medical School, London. In one octavo volume of 391 pages, with 73 engravings and 21 colored plates. Cloth \$3.75. Philadelphia : Lea Bros. & Co., 1893.

This, the fourth edition of this concise little work, is presented as the Preface says, for two reasons : first, the third edition is sold

out, and secondly, the new edition enables the author to bring the book abreast of the advances in otology. Both reasons argue in favor of its excellence, and should recommend it to those who wish to have as much information as possible in a small space.

One of the good points in this book is the careful descriptions of osseous tumors of the meatus, to which 30 pages are devoted, with the recital of the treatment of 25 cases.

The author condemns the practice of allowing patients to use Politzer's bag at home, which is too often resorted to by many practitioners, and cites cases where serious injury and even death have resulted from this cause. He also decries the use of Valsalva for the same reason. The latter method, we believe, should never be practiced by patients unless the external meatus be closed by the fingers at the same time.

In Chapter XIV under the caption of "The Value of Pain as a Symptom of Ear Disease" the author truly says that in cases of tinnitus and dizziness, the case is usually referred to a specialist, while those in which pain is a prominent symptom are commonly treated by the general practitioner, although the latter class of cases is many times the more serious, often threatening a fatal termination. The book contains twenty-one colored plates, which are well executed, and is neatly gotten up.

HANDBOOK OF THE DIAGNOSIS AND TREATMENT OF DISEASES OF THE THROAT, NOSE, AND NASO-PHARYNX. By CARL SEILER, M. D., Instructor in Laryngology and Lecturer on Diseases of the Upper Air Passages, in the University of Pennsylvania, etc. Fourth edition. Thoroughly revised and greatly enlarged. Illustrated with 2 lithographic plates, containing 10 figures, and 107 engravings, 12mo, 414 pages. Cloth, \$2.25. Philadelphia: Lea Bros. & Co., 1893.

This work is too well known to the readers of this JOURNAL to require extended notice. The author strangely describes the laryngoscope as, a "combination of two mirrors so arranged as to enable the observer to see the interior of the larynx." This does not accord with the teachings of Garcia and others, in that they consider the laryngoscope a single mirror, looking upon the head reflector as an accessory. It is unfortunate, too, that many of the anatomical illustrations are so diagrammatic.

The portion referring to voice production is what might be

looked for from an author whose position and associations have been such as to give him unusual advantages, and yet a consideration of articulation, language, dialect, accent, etc., would seem to belong more properly to a book of a popular or elocutionary character.

Some very valuable suggestions are given under, "Uterine Reflex Laryngitis." These points are chiefly original and worthy of careful consideration.

For some unexplainable reason, intubation is ignored in the treatment of stenosis of the larynx; this we consider a grave oversight, as it is undoubtedly the most important measure.

In the light of our present knowledge of acute coryza, it is somewhat surprising to read the following: "In regard to the treatment of this affection very little is to be said, inasmuch as everyone agrees that nothing can be done to shorten or stop the symptoms when once fully established, and, therefore, the disease is usually left to run its course."

The treatment of septal deflections is exceedingly practical and complete. On the whole, the work is to be recommended to the general practitioner and student.

Finally, the publishers are to be congratulated upon the excellent appearance of the book.

ANNOUNCEMENT.

Beginning with the January issue of the JOURNAL the corps of Associate Editors will be enlarged by the addition of Dr. F. G. Ritchie of New York, in the department of the Eye and Ear, and Dr. C. E. Teets of New York, in the department of Laryngology.





